The utilization of NSAIDs in the prescriptions of Migraine treatment at Neurology OPD of a Tertiary care Hospital

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ABSTRACT

Background: This study investigates the utilization patterns of non-steroidal anti-inflammatory drug in the management of migraine and headache among patients attending the neurology outpatient department of a tertiary care hospital in Bhubaneswar, India. NSAIDs, valued for their analgesic and anti-inflammatory properties, play a pivotal role in mitigating migraine symptoms. Despite the prevalence of migraine, there remains a dearth of research on NSAIDs prescribing trends in this context.

Methods: Through a cross-sectional study conducted from November 2021 to February 2022, data were collected from 300 patients, of whom 54% received NSAIDs.

Results: The study observed a median patient age of 34 years, with migraine patients constituting 34.33% of the cohort. Naproxen emerged as the most frequently prescribed NSAID, predominantly administered orally. Nevertheless, a mere 31.48% of NSAIDs were prescribed from the National List of Essential Medicines, Suggesting a possible variance from the other studies.

Conclusion: Moreover, NSAIDs were rarely co-prescribed with gastro protective agents, highlighting the need for improved adherence to gastrointestinal safety protocols. This study underscores the significance of comprehending prescribing patterns in migraine management to refine treatment strategies and optimize patient outcomes.

Keywords: Migraine, Naproxen, Neurology OPD, NSAIDs.

INTRODUCTION

Nonsteroidal anti-inflammatory drugs (NSAIDs) have long been recognized as fundamental agents in the management of migraine headaches, owing to their potent analgesic and anti-inflammatory properties. Migraine, a prevalent neurological disorder characterized by recurrent episodes of throbbing headaches often accompanied by symptoms and enhancing patients' quality of life, comprehending the prescribing patterns of NSAIDs in migraine management is paramount.

The trigeminovascular system assumes a pivotal role in the genesis of pain during migraine episodes (1). Vasodilation of blood vessels is induced upon the activation of neuropeptides such as calcitonin gene-related peptide, neurokinin A, and nociceptors (2).This cascade also induces peripheral sensitization, involving the activation of cyclooxygenase (COX-1 and COX-2) (3-5). Consequently, triptans and NSAIDs emerge as prominent choices for migraine treatment, given their widespread availability and cost-effectiveness (6).

Studies on drug utilization provide insights into prescribing patterns and the effectiveness of hospital formularies (7). Despite a comprehensive literature review, scant research exists on the prescribing patterns of NSAIDs in migraine patients. The current investigation aims to scrutinize the prescription trends of NSAIDs among migraine sufferers attending the neurology outpatient department at a tertiary care hospital in Bhubaneswar. Furthermore, this investigation endeavours to ascertain the concordance of the prescribed pharmacotherapies with the 2022 National List of Essential Medicines of India. By elucidating the prescribing patterns of NSAIDs in migraine management; this study seeks to contribute to the refinement of treatment strategies, thereby fostering improved outcomes for individuals grappling with this incapacitating condition.

METHODS:

Conducted between November 2021 and February 2022 in Bhubaneswar, India, this study was based in the Neurology Outpatient Department (OPD) of a tertiary care hospital. Employing a cross-sectional design, the study was initiated subsequent to obtaining approval from the Institutional Ethical Committee.

Eligibility criteria:

- Patients presenting to the neurology OPD with either migraine or headache complaints.

- Patients were prescribed NSAIDs during the study period, without regard toage, gender, diagnosis, or treatment regimen.

Non-eligibility criteria:

- Patients solely advised for diagnostic tests.

Collection of Data:

Information was gathered from 300 patients, with 162 meeting the predetermined eligibility and non-eligibility criteria. Demographic details (including age and gender) and clinical particulars (such as diagnosis, drug name, route of administration, concomitant medications, and treatment duration) were extracted from patients' prescriptions. Only NSAIDs prescribed by hospital physicians were considered. Generic drug names and constituents were sourced from various online healthcare platforms, including Tata 1mg, Netmeds, Practo, and PharmEasy. Descriptive statistics were utilized to analyse the collected data, with each parameter expressed as a percentage. Microsoft Excel 2019 facilitated data computation.

RESULTS:

The study, conducted within the neurology department, encompassed a cohort of 300 patients who presented with migraine or headache complaints. Of these, 190 patients (63.33%) reported experiencing headaches, followed by 103 patients (34.33%) diagnosed with migraines, and 7 patients (2.33%) exhibiting mixed headache symptoms. NSAIDs were prescribed to 162 patients constituting 69 patients (42.59%) with headaches, 88 patients (54.32%) with migraines, and 5 patients (3.08%) presenting with mixed headache symptoms (Table-1).

Table-1: Distribution of patients by indication for treatment

Indications	**No. of patients with headache (n=190)**	**No. of patients treated with NSAIDs (n=162)**
Headache	190 (63.33%)	69 (42.59%)
Migraine	103 (34.33%)	88 (54.32%)
Mixed Headache	7 (2.33%)	5 (3.08%)

Among the 162 patients receiving NSAIDs, 112 (69.13%) were identified as female, while 50 (30.86%) were male (Table-2).

Table-2: Gender-based distribution of patients in neurology outpatient department (n=162)

Gender	**No. of patients (Median age)**
Male	50 (41 years)
Female	112 (35 years)
Both Gender	162 (37 years)

The patient cohort spanned an age spectrum from 10 to 80 years, with the highest incidence of NSAIDs prescriptions observed in individuals aged 31-40 years (31.48%), succeeded by those aged 21-30 years (19.75%) and 41-50 years (17.28%) (Table-3).

Table-3: Analysis across different age ranges in neurology outpatient department (n=162)

Age	**No. of patients (%)**
Up to 10years	2 (1.23%)

11years to 20 years	13 (8.02%)
21 years to 30 years	32 (19.75%)
31 years to 40 years	51 (31.48%)
41 years to 50 years	28 (17.28%)
51 years to 60 years	21 (12.96%)
Above 60 years	15 (9.26%)

The median age of the patients was recorded as 37 years. Each prescription, on average, encompassed 3.2 drugs, with a median of 3 medications per prescription. The mean number of NSAIDs prescribed per patient stood at 1. Naproxen emerged as the predominant NSAID, exclusively administered orally. The mean spending on NSAIDs per patient amounted to 114.28 Indian Rupees (Table-4).

Table-4: Key indicators for medication use in neurology outpatient department (n=162): NSAIDs and co-prescriptions analysis

Indicators for use of medication	**Value**
Average no of NSAIDs per prescription	1
Median no of drugs per prescription	3
Average no of drugs per prescription	3.2
Percentage of patients on NSAIDs (Ibuprofen) from NLEM	31.48%
Average cost of NSAIDs per patient(INR)	114.28
route of administration (commonly observed)	Oral route

From this pool, 162 patients (54%) who were prescribed at least one NSAID were enrolled in the study (Table-5).

Table-5: Patient distribution based on the number of analgesics prescribed (n=162)

No. of NSAIDs	**No. of patients**
One Drug	162
Two Drugs	0

Of the 162 patients receiving NSAIDs, the majority (108 patients, 66.66%) were prescribed Naproxen, followed by Ibuprofen (31.48%) and Etoricoxib (1.85%). Among migraine patients (n=88), all received one of the NSAIDs Naproxen, Etoricoxib, or Ibuprofen, with

Naproxen being the most commonly prescribed (94.25%). The study illustrates the frequent co-prescription of Naproxen alongside Domperidone (Table-6).

Table-6: Usage patterns of NSAIDs among migraine patients (n=88) in the neurology outpatient department (n=162) of a tertiary care hospital

Drugs (generic)	**No. of patients in Neurology OPD (percentage), n=162**		**No. of migraine patients (percentage), n=88**	
Naproxen + Domperidone	108	66.66%	82	94.25%
Ibuprofen	51	31.48%	4	4.59%
Etoricoxib	3	1.85%	2	2.29%

Additionally, NSAIDs were concurrently prescribed with proton pump inhibitors (PPIs), antidepressants, antihypertensives, antivertigo medications, antiepileptics, and vitamins. Notably, vitamins, constituting 34.56% of co-prescriptions, emerged as the most prevalent adjunctive medications (Table-7).

Table-7: Concomitant drugs with NSAIDs in headache and migraine patients (n=162) in the neurology outpatient department of a tertiary care hospital

Category of drugs	**No. of drugs**	**Percentage**
Antiepileptic	111	68.51%
Vitamins	71	43.82%
Proton pump inhibitors	60	37.03%
Anti-depressants	43	26.54%
Anti-anxiety	14	8.64%
Anti-vertigos	12	7.4%
Anti- hypertensive	10	6.17%

DISCUSSION:

Globally, approximately half of the adult population experiences headaches (8,9), with a notably higher prevalence observed among females (10). It is estimated that around 40% of individuals worldwide suffer from tension-type headaches, while 10% are afflicted by migraines (11). In the present study, 63.33% of patients reported headaches, and 34.33% were

diagnosed with migraines, indicating a relatively higher proportion of migraine sufferers compared to the global average. Prior research indicates that the prevalence of headaches peaks between the ages of 20 and 64 (12), which are consistent with our findings where 31.57% of the study cohort fell within this age range, with a median age of 37 years.

Nonsteroidal anti-inflammatory drugs (NSAIDs) mitigate the production of prostaglandins by inhibiting the cyclooxygenase (COX) enzyme (13). Commonly utilized NSAIDs for migraine prophylaxis include Ibuprofen, Aspirin, Acetaminophen, Naproxen, and Diclofenac. For instance, a 1000 mg dose of Aspirin has been shown to alleviate headache pain within two hours in 52% of migraine cases (14). Ibuprofen is regarded as one of the safest traditional NSAIDs and has demonstrated superior efficacy in paediatric trials (15). Acetaminophen is frequently recommended for mild to moderate pain with minimal inflammatory involvement. Naproxen exhibits a more pronounced anti-inflammatory effect relative to other NSAIDs (16), whereas intramuscular Diclofenac proves more efficacious than its oral counterpart (17). Nevertheless, NSAIDs are associated with gastrointestinal complications such as epigastric pain and upper gastrointestinal bleeding, and selective COX-2 inhibitors have been linked to cardiovascular events (18). These adverse effects underscore the necessity for meticulous drug utilization studies in migraine patients.

Among the 300 patients 162 met the study criteria. Of these, 42.59% experienced headaches, and 54.32% suffered from migraines were prescribed with at least one NSAID. The study identified NSAIDs such as Naproxen, Ibuprofen, and Etoricoxib as commonly prescribed, with Naproxen being the most frequently utilized, consistent with findings from other investigations (6). Contrarily, some studies have reported Aspirin as the predominant NSAID prescribed (19). All NSAIDs in this study were administered orally.

The average cost per prescription in this study was 672.56 INR, with NSAIDs constituting 114.28 INR or 16.99% of the total cost, which is lower compared to other studies (20).

NSAIDs are frequently prescribed alongside gastro protective agents to mitigate gastrointestinal side effects (21). In this study, only 37.03% of NSAID prescriptions included proton pump inhibitors, likely because 94.25% of patients received a combination of Naproxen and Domperidone, a D2 receptor antagonist with prokinetic properties (22).

According to the National List of Essential Medicines (NLEM) 2022, essential NSAIDs include Ibuprofen, Diclofenac, Paracetamol, and Aspirin. Only 31.48% of NSAIDs prescribed in this study were from the NLEM (Ibuprofen), compared to 49.72% in another study (23). The most frequently utilized Naproxen is not in the NLEM list. Utilizing a limited selection of essential medications can enhance healthcare outcomes, increase drug availability, reduce costs, and improve access to necessary treatments. Therefore, it is recommended to consider the inclusion of Naproxen in the list of essential medicines.

CONCLUSION:

An exhaustive analysis of data accrued from 300 patients over a four-month timeframe elucidated that NSAIDs were prescribed to 54% of individuals presenting with headaches and migraines at the Neurology Outpatient Department. Specifically, 54.32% of patients diagnosed with migraines were administered NSAIDs. The median age of the cohort was 37 years, with Naproxen emerging as the most prevalently prescribed NSAID. Naproxen was used in combination with domperidone. The administration route for all NSAIDs was oral. The mean expenditure per patient for NSAID therapy amounted to 114.28 INR. Remarkably, a mere 37.03% of NSAID prescriptions were accompanied by proton pump inhibitors, and about 31.48% of patients were prescribed NSAIDs listed in the 2022 National List of Essential Medicines. Despite the well-documented efficacy of NSAIDs in mitigating migraine symptoms, there exists a considerable gap in the comprehension of prescribing patterns within this clinical context. Bridging these gaps can enable healthcare professionals to fine-tune therapeutic strategies, thereby enhancing adherence to essential medication

guidelines and curtailing the risk of adverse events. Ultimately, such measures hold the potential to significantly elevate the quality of care rendered to migraine sufferers, alleviating the pervasive burden.

ACKNOWLEDGEMENT:

The authors are thankful to the management of Siksha 'O'Anusandhan University, for providing the research facilities.

CONFLICT OF INTERESTS

No conflict of interest was declared by the authors.

FUNDING SOURCE

The authors did not receive any source of funds.

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