Prescribing pattern of NSAIDs in migraine patients of Neurology OPD at a tertiary care hospital in Bhubaneswar

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Abstract---NSAIDs (nonsteroidal anti-inflammatory drugs) are the most commonly used drugs in treatment of migraine. The present study is conducted to evaluate prescription patterns of NSAIDs in migraine patients in neurology OPD of a tertiary care hospital in Bhubaneswar. NSAIDs were prescribed to 30% of patients with complaint of headache and migration visiting Neurology OPD. 47.61% of migraine patients have received NSAID. 80.7% patients receiving NSAIDs were female. The median age of patients was 34 years. The average number of NSAIDs per prescription was 1.01. The present study showed the use of NSAIDs like Naproxen, Aspirin, Ibuprofen, Paracetamol, Diclofenac and Etoricoxib. Naproxen was the most common NSAIDs prescribed. About 7% of patients were prescribed with NSAIDs from the National List of Essential medicines, 2015. All NSAIDs were administered by oral route. The average cost of NSAIDs per patient was 128.53 INR. Only 10.3% of NSAIDs were co-prescribed with proton pump inhibitors.

Keywords---NSAIDs, Neurology OPD, Aspirin.

Introduction

The trigeminovascular system plays a key role in pain-generating mechanism during migraine attacks (1). Neuropeptides like neurokinin A, calcitonin gene-related peptide, and substance P are released when the nociceptors are activated. Due to release of neuropeptides, the dura mater develops neurogenic inflammation, resulting in further dilation of the blood vessels (2). Peripheral sensitization with activation of cyclooxygenases (COX-1 and COX-2) also occurs.
after the release of these neuropeptides (3-5). The triptans and NSAIDs (nonsteroidal anti-inflammatory drugs) are the most commonly used migraine treatments because of their availability and cost-effectiveness (6). Drug utilization studies tell us about drug prescribing trends and efficiency of hospital formularies (7). Thorough literature survey does not reveal enough study on prescribing pattern of NSAIDs in migraine patients. The present study is conducted to evaluate prescription patterns of NSAIDs in migraine patients in neurology OPD of a tertiary care hospital in Bhubaneswar. This study is also aimed to evaluate whether the prescribed medicines are listed in the National list of essential medicines (NLEM), 2015 of India.

**Subject and Methods**

This study was carried out in Bhubaneswar, India from November 2021 to February 2022 in the Neurology OPD department of a tertiary care hospital. A cross-sectional study design was applied for this study. The Institutional Ethical Committee permission was taken before execution of the study.

**Inclusion criteria:**

- Patients visiting the neurology OPD with a complaint of migraine and/or headache.
- Patients prescribed with NSAIDs during study regardless of age, sex, diagnosis and treatment.

**Exclusion Criteria:**

- Patients who are advised to have tests only.

**Collection of data:**

Data were collected from a total of 190 patients. Only 57 patients were eligible as per inclusion and exclusion criteria. Demographic data (such as age and gender) as well as clinical information (such as a diagnosis, the name of the drug, its route of administration, additional medications, and course of treatment) were gathered from the patient’s prescription. NSAIDs prescribed by the doctors of the hospital were considered in this study. The generic names and constituents of the drugs were obtained from online healthcare platforms like Tata 1mg, Net meds, Practo, Pharmeasy etc. In order to evaluate the results, descriptive statistics were used. Each parameter was represented in percentage. Microsoft Excel 2019 was used for the computation of the Data.

**Results**

A total of 190 patients with complaint of migraine or headache coming to the neurology department were enlisted. They include 120 patients (63.15%) suffering from headache followed by 63 patients (33.15%) suffering from migraine and 7 patients (3.68%) suffering from mixed headache. However, 57 patients (30%) receiving at least one NSAID were included in the study. NSAIDs were prescribed to 24 (42.1%) patients with headache, 30 (52.63%) patients with migraine, and 3 (5.26%) patients with mixed headache. From 57 patients 46 (80.7%) were female, and 11 (19.29%) were male [Table1].
The patient age varies from 10-80 years. A maximum number of NSAIDs was prescribed in the age group of 21-30 years (21.05%) followed by 10-20 years (19.29%) and 31-40 years (17.54%). The median age of patients was 34 years. The average number of drugs per prescription was 4.42. The median number of drugs per prescription was 4. The average number of NSAIDs per prescription was 1.01. Naproxen was the most common NSAIDs prescribed. All NSAIDs were administered in the oral route. The average cost of NSAIDs per patient was 128.53 INR [Table-1]

In this study, fifty-six patients received a single NSAID and only one patient received a two NSAID combination (Diclofenac plus Paracetamol). In this study, out of 58 NSAIDs most commonly prescribed NSAIDs was Naproxen (85.96%), followed by Etoricoxib (7.01%), Aspirin (3.5%), Ibuprofen (1.75%). All the migraine patients (n=30) received any one NSAID from Naproxen, Etoricoxib, Ibuprofen and Diclofenac plus Paracetamol. The most commonly prescribed NSAID was Naproxen (86.6%, n=26). Naproxen was co-prescribed with Domperidone [Table-2]. NSAIDs were co-prescribed with proton pump inhibitors or (PPIs), anti-depressants, anti-hypertensive, anti-vertigo drugs, anti-epileptics, and vitamins. Vitamins (59.44%) were the most commonly co-prescribed drugs [Table-3].

**Discussion**

NSAIDs act by blocking the cyclooxygenase enzyme thereby reducing the synthesis of prostaglandins (7). NSAIDs like Ibuprofen, Aspirin, Acetaminophen, Naproxen, Diclofenac etc are commonly used to prevent migraine headaches. In 52% of migraine attacks, 1000mg dose of aspirin eases headache pain within two hours (9). Ibuprofen is mainly rated as the safest traditional NSAIDs. Ibuprofen performs better in a trial carried out in children (10). Acetaminophen is recommended in mild to moderate pain with less inflammation. The anti-inflammatory effect of Naproxen is more substantial than others (11). Intramuscular diclofenac provides remarkable results than oral formulation (12). NSAIDs are associated with gastrointestinal toxicity including epigastric pain and upper GI bleeding. Selective COX-2 inhibitors cause cardiovascular thrombotic events (13). So, there is a need of drug utilization studies in migraine patients.

Globally, 50% of adults suffer from headaches (14-15). Headaches are predominant in female (16). An estimated 40% of people worldwide suffer from tension-type headaches, and 10% suffer from migraines (17). 63.15% of patients were diagnosed with headache and 33.15% with migraine in this study. A higher percentage of migraine patients are there in this study. Global prevalence study shows that the prevalence peak of headache is between the age group of 20-64 (18). In this study 31.57% of patients belong to this age group category. The median age of patients was 34 years.

57 out of the 190 patients who met the inclusion and exclusion criteria were enrolled in the study. 42.1% patients out of them were suffering from headache and 52.63% were suffering from migraine. Again, 47.61% of migraine patients have received NSAID whereas only 20% of headache patients have received NSAID. The present study showed the use of NSAIDs like Naproxen, Aspirin, Ibuprofen, Paracetamol, Diclofenac and Etoricoxib. Naproxen was most frequently
prescribed brand which is in agreement with earlier studies (6). But in some studies, aspirin was commonly prescribed (19). The route of administration of all the NSAIDs was oral.

As per NLEM 2015, the drugs like ibuprofen, diclofenac, Paracetamol and aspirin are essential NSAIDs. In this study, only 7% of NSAIDs were prescribed from the National List of Essential medicines (NLEM). In a study, 49.72% of NSAIDs were prescribed from the essential medicine list (20). Using only a few proven, essential medications would result in improved health care, increased supply, reduced costs, and easier access to products for all people. So there is a need for adding Naproxen in the list of essential medicines.

The average cost per prescription was 581.77 INR and the average cost of NSAIDs per prescription was 128.07 INR which is 22.01% of total prescription. Comparatively, the average price of NSAIDs was lower than other studies (21). NSAIDs are co-prescribed with gastroprotective agents to reduce gastrointestinal adverse events (22). Only 10.3% of NSAIDs were co-prescribed with proton pump inhibitors in this study. This may be because 86% of patients were prescribed with Naproxen which is available with Domperidon and Domperidone is a D2 receptor antagonist with prokinetic actions (23).

**Conclusion**

NSAIDs were prescribed to 30% of patients with complaint of headache and migration visiting Neurology OPD. 47.61% of migraine patients have received NSAID. The median age of patients was 34 years. The most commonly prescribed NSAID was Naproxen. All the NSAIDs were administered by the oral route. The average cost of anti-epileptics per patient was 128.07 INR. Only 10.3% of NSAIDs were co-prescribed with proton pump inhibitors and about 7% of patients were prescribed with NSAIDs from the National List of Essential medicines, 2015.

Table-1: Prescribing pattern of NSAIDs in headache and migraine patients of Neurology OPD of a tertiary care hospital and drug use indicators assessed.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(years)</td>
<td></td>
</tr>
<tr>
<td>Oct-20</td>
<td>11(19.29%)</td>
</tr>
<tr>
<td>21-30</td>
<td>12 (21.05%)</td>
</tr>
<tr>
<td>31-40</td>
<td>10 (17.54%)</td>
</tr>
<tr>
<td>41-50</td>
<td>7 (12.28%)</td>
</tr>
<tr>
<td>51-60</td>
<td>9 (15.78%)</td>
</tr>
<tr>
<td>≥60</td>
<td>8 (14.03%)</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>11(19.29%)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>46 (80.70%)</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td></td>
</tr>
<tr>
<td>HEADACHE</td>
<td>24(42.1%)</td>
</tr>
<tr>
<td>MIGRAINE</td>
<td>30 (52.63%)</td>
</tr>
<tr>
<td>MIXED HEADACHE</td>
<td>3(5.26%)</td>
</tr>
</tbody>
</table>
### NUMBER OF NSAIDs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONE DRUG</strong></td>
<td>56</td>
</tr>
<tr>
<td><strong>TWO DRUGS</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**INDICATORS ASSESSED**  
DATA value

**Average number of NSAIDs per prescription**  
1.01

**Median number of drugs per prescription**  
4

**Average number of drugs per prescription**  
4.42

**Percentage of patients on NSAIDs from NLEM**  
7.01%

**Average cost of NSAIDs per patient(INR)**  
128.07

**Most common route of administration**  
p.o. (per oral)

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**Table 2: Utilization pattern of NSAIDs among migraine patients (n=30) in Neurology OPD (n=57) of a tertiary care hospital**

<table>
<thead>
<tr>
<th>Generic name</th>
<th>Number of patients in Neurology OPD (percentage), n=74</th>
<th>No of migraine patients (percentage), n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen + Dompeidone</td>
<td>49 [85.96%]</td>
<td>26 [86.66%]</td>
</tr>
<tr>
<td>Etoricoxib</td>
<td>4 [7.01%]</td>
<td>2 [6.66%]</td>
</tr>
<tr>
<td>Aspirin</td>
<td>2 [3.50%]</td>
<td>-</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>1 [1.75%]</td>
<td>1 [3.33%]</td>
</tr>
<tr>
<td>Diclofenac + Paracetamol</td>
<td>1 [1.75%]</td>
<td>1 [3.33%]</td>
</tr>
</tbody>
</table>

**TABLE-3 Drugs co-prescribed with NSAIDS in headache and migraine patients (n=57) of Neurology OPD of a tertiary care hospital**

<table>
<thead>
<tr>
<th>Category of drugs</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin</td>
<td>34</td>
<td>59.64%</td>
</tr>
<tr>
<td>Antiepileptic</td>
<td>19</td>
<td>33.33%</td>
</tr>
<tr>
<td>Anti-depressants</td>
<td>29</td>
<td>17.57%</td>
</tr>
<tr>
<td>Proton pump inhibitors</td>
<td>17</td>
<td>10.30%</td>
</tr>
<tr>
<td>Anti- hypertensive</td>
<td>17</td>
<td>10.30%</td>
</tr>
<tr>
<td>Anti-vertigo</td>
<td>5</td>
<td>3.03%</td>
</tr>
</tbody>
</table>
References