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Research Article

# STUDY ON THE USE PATTERN OF NSAIDS IN SOME GENERAL AND SPECIALIZED HOSPITALS OF BANGLADESH

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**ABSTRACT**
This study was designed to assess the present use pattern of both traditional nonsteroidal anti-inflammatory drugs (tNSAIDs) and cyclooxygenase 2 (COX-2)-selective NSAIDs (coxibs) in terms of demographic characteristics, prevalence of use of NSAIDs type, gastro-protective drug use frequency among the patients of four general hospitals and another five specialized hospitals of Dhaka city. The study was conducted during 3 May to 18 May 2011. Total 480 patients were asked to answer the questions of the previously designed questionnaire covered with some closed ended dichotomous and multichotomous questions. Most prevalent age group of the patients was between 40-65years. Again, use of tNSAIDs was relatively higher than that of coxibs. Besides, among the NSAIDs, ketorolac tromethamine (a tNSAID) was the most frequently used drug (29.3%) in the general hospitals (GnH) whereas diclofenac sodium (a tNSAID) was common (58%) in the specialized hospitals (SpH) counterpart. Moreover, a significant number of patients did not use gastro-protective medication whenever taking NSAIDs. Most prevailing gastroprotectives were Proton Pump Inhibitor (PPI) and $H_2$ receptor antagonist. Apart from these, another critical observation from this study was the lack of following proper indication related to medication specially for taking the gastroprotective drugs. In conclusion, it can be said that although in most cases, the use pattern of NSAIDs is proper and justified but to avoid unwanted complications and misuse of the drugs, both physicians as well as drug users need to be more aware.
**KEYWORDS:** nonsteroidal anti-inflammatory drugs(NSAIDs); traditional NSAIDs (tNSAIDs); selective COX-2 inhibitors (coxibs);Gastroprotectives; General Hospitals (GnH); Specialized Hospitals (SpH)

## INTRODUCTION

Non-steroidal anti-inflammatory drugs (NSAIDs), including traditional NSAIDs (tNSAIDs) and cyclooxygenase 2 (COX-2)-selective NSAIDs (coxibs), are among the most commonly prescribed categories of drugs worldwide in the treatment of pain and inflammation in many conditions and considered as over the counter (OTC) drugs. Each day, it is estimated that 30 million people worldwide get benefit from their anti-inflammatory and analgesic effects.[1,2] NSAIDs are used primarily to treat inflammation, mild-to-moderate pain, and fever. Specific uses include the treatment of headaches, arthritis, sports injuries, and menstrual cramps[3]. Although NSAIDs is providing huge benefit in term of pain relief, there is an increased risk of adverse drug reactions (ADRs) associated with the use of these drugs and gastrointestinal complications ranging from stomach pain to ulcers. Moreover, frequent use of these drugs are responsible for liver and kidney damage[4,5] Even in the USA, the side effects of long-term NSAID use cause nearly 103,000 hospitalizations and 16,500 deaths as has been reported by Feenstra J *et al.* [6] Similarly, among 1756 patients admitted to a geriatric unit in Italy, 58% showed certain or probable adverse drug reactions (ADRs), and NSAIDs were involved in 23.5% of these.[7] Besides, numerous other studies revealed Significant number of prescriptions of this group of drugs without proper diagnosis[8,9], time duration was not indicated in some cases[9], significant difference in prescription pattern with respect to pharmacological sub-classes of NSAIDs between government and non-government hospitals in spite of having same clinical conditions[10].

Despite the widespread use of this group of drugs, there is little information on the characteristics of the population using the drugs, their attitudes toward understanding of these drugs and their potential toxic effect. Knowledge of such public attitudes and patterns of use is therefore vital to avoid the possible risks associated with the use of these drugs, to maintain rational use of this widely prescribed but ADRs rich OTC drugs. The aim of this study was therefore to assess the use pattern of NSAIDs in some private as well as public general and specialized hospitals of Bangladesh in terms of demographic characteristics of the users, awareness level regarding dosage regimen maintain, prevalence of concurrent use of gastroprotective drugs and prevalence of tNSAIDs and coxibs use.

## MATERIAL AND METHODS

### Study Design

This study was carried out among the patients of some general (category-1) and specialized (category-2) hospitals. The former group (category-1) includes four different orthopedic outpatient departments of general hospitals namely DMCH (Dhaka Medical College Hospital), SSMCH (Sir Salimullah Medical College Hospital), ShSMCH (Shahid Sohrawarthy Medical College Hospital) and BSMMUH (Bangabandhu Sheikh Mujib Medical University Hospital) in Dhaka city of Bangladesh. Again, the latter group (category-2) includes another five different government and private specialized hospitals namely NITOR (National Institute of Traumatology, Orthopedics and Rehabilitation Centre, NICVD (National Institute of Cardiovascular Disease), BICWC (Bangladesh Institute of Cancer and Welfare Centre), NIEO(National Institute of Eye and Ophthalmology) in Dhaka city.

### Study Population

The study population included total four hundred and eighty (480) patients with different sex and various age ranges (e.g. children, teenage, adults, elderly etc.) in the study period. Among the patients of the general hospitals, 75% male and 25% female were participated. Again, 76% male and 24% female patients of specialized hospitals took part in the study. These figures indicating similar ratio of male and female patients in both categories of the hospitals.

### Data Collection

Data was collected during 3 May to 18 May of the year 2011.

**Questionnaire Type**

A self-administered questionnaire was set with some close-ended type questions including dichotomous questions type ('Yes' / 'No' question) and multi-chotomous question type (multiple choice questions) consisting three or more exhaustive, mutually exclusive categories to meet the purpose of our study.[11,12]

**Analysis of the Data**

The obtained data from the questionnaire were analyzed in a way to arrange the age distribution of the patients, academic qualification, area, gender, disease state of the male and female patients, frequency of use of selective or non-selective NSAIDs, prevalence of taking gastro-protective medications and so on. A statistical analytical tool, SPSS software of version 11.5 was used for descriptive statistical analysis of the data.

**RESULTS**

Demographic characteristics of the patients are shown in Table 1. As has been observed, a huge number of patients are coming out of Dhaka for taking treatment both in the general as well as in the specialized hospitals which amounting to 38.9% and 57% respectively. Female patients number was one third of the male and 40-65 age ranged patients was higher in both of the cases (Table 1) It is also important to note that a significant number of the patients were illiterate (31.7% and 43.5% respectively in the general and specialized hospitals).

Although most of the patients took advice from specialized doctor but there were some cases as well where patients went to nearest pharmacy, quack doctor or acquaintance for taking advice regarding medication use (Table 2).

Bone fracture or traumatic injury was the major clinical condition, the patients suffering with, in both categories of the hospitals. Besides, gout (3.9%), lower back pain (15.6%), rheumatic arthritis (10%) and kidney problem (2.8%) in cases of cancer were observed in GnH whereas post operative pain (10%), cancer (18%), and pain in the eye (19%) and dental pain (7%) were recognized among the patients of the SpH (Table 3).

Among the different available NSAIDs, Diclofenac, a tNSAIDs was extensively used both in the GnH (27.7%) and SpH (58%). Of course, ketorolac was another commonly prescribed drug (29.3%) in GnH (Table 4). Although, coxibs possess some superiority over tNSAIDs, still use of this class of drug is minor. Etoricoxib was the only coxibs used in GnH (1.4%) as well as SpH (5.5%). Besides, celecoxib was also prescribed in GnH but very negligible number (0.5%).

Few cases of multiple NSAIDs prescription for individual were also observed in both categories of the hospitals (Table 5). Although long term treatment with NSAIDs is prohibited, this study revealed some cases of long term use of this class of drugs for 6 months to over years in the GnH (Table 6).

To resist GI adverse effects associated with NSAIDs use, a Proton Pump Inhibitor (PPI), $H_2$ receptor blocker or local acting antacids were co-prescribed with NSAIDs. PPI was mostly prescribed in GnH and SpH, amounting to 74.7% and 43% respectively. $H_2$ receptor antagonist was also prescribed whereas local acting antacid use was negligible (Table 7)

Another critical observation from this study was that a significant number of patients did not follow the indication properly or the respective physicians did not indicate properly regarding dosage regimen. A few numbers of patients did not take any gastro-protective drugs when using NSAIDs. Taking gastro-protective drug half an hour before meal is recommended but some were taking it with meal or did not maintain proper timing with meal (Table 8)

**DISCUSSION**

It is well observed from this survey that, most of the patients were prescribed tNSAIDs to treat different inflammatory conditions. Although tNSAIDs are associated with high rate of GI complications[13, 14] but possess low risk of cardiovascular complications than that of coxibs[15]. Several studied revealed that coxibs use has been restricted to avoid the risk of heart attack and stroke.[15-17] Besides, cost of coxibs are also higher than the available NSAIDs. Therefore, the minor prescription of this class of NSAIDs, observed from this study is rational.

Evaluation of the questionnaire also revealed that there was a great deal of drug misuse in terms of wrong indication, longer duration of use and following prescription from unprofessional personnel like friends, relatives or salesmen of pharmacy shop. Most of the NSAIDs are indicated to take for short-term therapeutic management but above 10 to 20% of the respondents of general hospitals were taking the medication for six months to over years. They are obviously at risk of heart problem and GI bleeding.

To manage NSAIDs associated upper GI side effects, a proton pump inhibitor (PPI) or $H_2$ receptor antagonist is usually recommended. Above 70% of the respondent at GnH were found to use PPI inhibitors along with respective NSAIDs. In SpH, predominance of using PPI or $H_2$ receptor antagonist was almost similar. For patients who are at high risk of ulcers and complications, there is a need for effective and well-tolerated prophylactic therapy that can be given alongside NSAID therapy and PPI has been shown to provide superior performance than that of $H_2$ receptor antagonist.[18,19] Therefore, physicians who are recommending $H_2$ receptor antagonist or locally acting antacid instead of PPI, should be aware of the patients risk profile. Another critical observation from this study was that 4 to 8% of the respondents did not take any gastroprotective along with NSAIDs and some other did not take at proper time, that is, they took half an hour before meal which raises noncompliance of the drug use.

20 to 30 % of the patients of general and specialized hospitals took multiple NSAIDs per time with an intention that pain relief is achieved faster when two or more NSAIDs are ingested, may be influenced by wrong counsel. It has been also reported that, about 50% of the respondents of SpH and 31.7% of GnH counterpart were illiterate. It is quite impossible for them to follow the indications of the respective drug's leaflet if they are not properly counselled or dictated regarding the drug use. Consequently, clinical conditions could be more complicated by overuse or misuse of NSAIDs.

**CONCLUSION**

NSAIDs is vital for clinical management of a wide range of conditions, but it is mostly accompanied by gastrointestinal complications. For healing of NSAID-associated ulcers or ulcer complications, the most effective and well-tolerated management is provided by a PPI. To ensure safe, effective and well-balanced therapeutics management of this major group of drugs, both patients and prescribers should be more aware of the appropriate dose, dosage regimen and overall indications.

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**Table 1: Demographic characteristics of the patients**

| Characteristics | | Hospitals | |
|---|---|---|---|
| | | General No. (%) | Specialized No. (%) |
| Area of the patients | Dhaka | 70 (38.9) | 171 (57) |
| | Out of Dhaka | 110 (61.1) | 129 (43) |
| Sex | Male | 135 (75.0) | 228 (76) |
| | Female | 45 (25.0) | 72 (24) |
| Age Range (years) | >12 | 17 (9.4) | 30 (10) |
| | 13-24 | 34 (18.9) | 77 (25.6) |
| | 25-39 | 48 (26.7) | 88 (29.4) |
| | 40-65 | 73 (40.6) | 93 (31) |
| | >65 | 8 (4.4) | 12 (4.0) |
| Education Level | None | 57 (31.7) | 130 (43.5) |
| | Primary school | 37 (20.6) | 49 (16.5) |
| | Secondary school | 62 (34.4) | 77 (25.8) |
| | University / Post Graduation education | 24 (13.3) | 42 (14.2) |

**Table 2: First consultation made by the patients**

| Consultation | General No. (%) | Specialized No. (%) |
|---|---|---|
| Nearest Pharmacy | 23 (12.8) | 44 (14.86) |
| Quack | 7 (3.9) | 15 (5.04) |
| Relative/Friends/Others | 5 (2.8) | 27 (8.9) |
| Specialized Consultant | 145 (80.6) | 214 (71.2) |

**Table 3: Clinical conditions of the patients**

| Clinical Conditions | General No. (%) | Specialized No. (%) |
|---|---|---|
| Bone fracture | 88 (48.9) | 148 (46) |
| Gout | 7 (3.9) | 0 (0.0) |
| Lower back pain | 28 (15.6) | 0 (0.0) |
| Rheumatic arthritis | 18 (10.0) | 0 (0.0) |
| Cancer | 26 (14.4) | 54 (18) |
| Kidney problem | 5 (2.8) | 0 (0.0) |
| Post operative pain | 0 (0.0) | 30 (10) |
| Pain in the eye | 0 (0.0) | 57 (19) |
| Dental pain | 0 (0.0) | 21 (7.0) |
| Others | 8 (4.4) | 0 (0.0) |

**Table 4: Type of NSAIDs used by the respondents**

| Type of NSAIDs | | General No. (%) | Specialized No. (%) |
|---|---|---|---|
| Non-selective | Ketorolac | 61 (29.3) | 75 (25) |
| | Diclofenac | 58 (27.8) | 175 (58) |
| | Paracetamol | 26 (12.5) | 0 (0.0) |
| | Naproxen | 19 (9.1) | 15 (5.0) |
| | Aceclofenac | 13 (6.1) | 8 (2.7) |
| | Ibuprofen | 7 (3.4) | 5 (1.8) |
| | Indomethacin | 6 (2.8) | 6 (2.0) |
| | Ketoprofen | 5 (2.4) | 0 (0.0) |
| | Dexibuprofen | 4 (1.9) | 0 (0.0) |
| | Tenoxicam | 3 (1.4) | 0 (0.0) |
| | Aspirin | 2 (0.9) | 0 (0.0) |
| | Methyl salicylate | 1 (0.5) | 0 (0.0) |
| Selective | Etoricoxib | 3 (1.4) | 16 (5.5) |
| | Celecoxib | 1 (0.5) | 0 (0.0) |

**Table 5: Single or multiple NSAID use per time**

| Amount of NSAIDs per administration | General No. (%) | Specialized No. (%) |
|---|---|---|
| Single NSAID per time | 135 (79.4) | 203 (67.7) |
| Multiple NSAIDs per time | 35 (20.6) | 97 (32.3) |

**Table 6: Duration of use**

| Duration | General No. (%) | Specialized No. (%) |
|---|---|---|
| One week | 62 (34.4) | 285 (95) |
| One month | 57 (31.7) | 15 (5.0) |
| Six months | 36 (20.0) | (0.0) |
| One year or more | 25 (13.9) | (0.0) |

**Table 7: Gastroprotective drug use pattern**

| Type | General No. (%) | Specialized No. (%) |
|---|---|---|
| $H_2$ receptor antagonist | 40 (24.7) | 150 (50) |
| Proton Pump Inhibitor (PPI) | 121 (74.7) | 129 (43) |
| Local acting | 1 (0.6) | 21 (7.0) |

**Table 8: Time of taking gastroprotective drugs**

| Time of taking gastroprotective drugs | General No. (%) | Specialized No. (%) |
|---|---|---|
| ½ an hour before meal | 29 (23.4) | 225 (75.1) |
| After meal | 70 (56.4) | 43 (14.3) |
| No relation with meal | 15 (12.1) | 18 (6.0) |
| Not taken | 10 (8.1) | 14 (4.6) |

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