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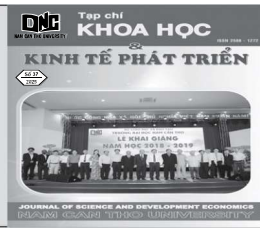

The assessment of gastrointestinal and cardiovascular risks and the rational use of non-steroidal anti-inflammatory drugs in outpatient treatment at Nam Can Tho University Hospital in 2024

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ABSTRACT

This study aims to assess the gastrointestinal and cardiovascular risks and the rational use of non-steroidal anti-inflammatory drugs in outpatient treatment. A descriptive cross-sectional study was conducted using 253 outpatient prescriptions of patients who were treated at the Nam Can Tho University from July to December 2024. Patients aged ≥ 18 years and having used at least one type of NSAIDs were included in the study. The data collection process involved analyzing prescription and recording demographic characteristics, types of NSAIDs used, as well as gastrointestinal and cardiovascular risks and the rational use of NSAIDs. Quebec Medical Council guideline was applied to assess the gastrointestinal and cardiovascular risks, which were classified into three categories: low, moderate, and high. Patients who are under 60 years old accounted for a higher proportion and were mostly men from Can Tho city. Musculoskeletal and connective tissue diseases were the most common group (58.89%). Meloxicam (45.85%) and Etoricoxib (26.88%) were most commonly prescribed. 34.39% of patients were prescribed proton pump inhibitors. Low gastrointestinal risk (64.03%) and low to moderate cardiovascular risk (90.91%) were the highest. NSAIDs are reasonably prescribed for both gastrointestinal and cardiovascular risks, accounting for 75%. Patients mostly have low gastrointestinal risk and low cardiovascular risk. The proportion of NSAIDs prescribed appropriately is higher than those prescribed inappropriately.

1. INTRODUCTION

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are among the most widely used drug groups in clinical practice. According to statistics by Singh G, more than 30 million people worldwide use NSAIDs daily. These drugs are also included in the World Health Organization's list of essential medicines and are commonly used in most countries around the world. However, the widespread use of NSAIDs—particularly among the elderly—raises significant concerns regarding potential side effects such as gastrointestinal bleeding and renal dysfunction. Although numerous studies on the use of NSAIDs have been conducted both globally and in Vietnam, research evaluating the gastrointestinal and cardiovascular risk levels associated with these drugs remains limited.

At Nam Can Tho University Hospital, NSAIDs are widely used. Therefore, it is essential to study and evaluate the risks and appropriateness of NSAID use to optimize treatment and minimize patient risks. This study was conducted to assess the usage of NSAIDs and evaluate the levels of gastrointestinal and cardiovascular risk, while also examining the appropriateness of NSAID prescriptions based on those risk levels. The goal is to provide essential information for developing guidelines for the rational and safe use of NSAIDs in clinical practice.

2. MATERIALS AND METHODS

2.1 Materials

Study subjects: Prescriptions of patients treated at the Outpatient Department, Nam Can Tho University Hospital, during the period from July 2024 to December 2024.

Inclusion criteria: Prescriptions of patients aged 18 years and older who were prescribed at least one non-steroidal anti-inflammatory drug (excluding low-dose aspirin).

Exclusion criteria: Prescriptions for pregnant or breastfeeding women, and prescriptions lacking sufficient administrative or treatment-related information.

2.2 Methods

2.2.1 Sampling method

This study was conducted using a cross-sectional descriptive design.

The number of prescriptions was calculated using a statistical formula.

$$n = \frac{Z^2_{1-\alpha/2} * p(1-p)}{d^2}$$

Where:

n: required sample size.

Z: confidence coefficient; with a 95% → Z = 1,96.

α: significance level (α = 0,05).

d: margin of error (d= 0,03).

p: proportion of rational NSAID use considering both gastrointestinal and cardiovascular risks. According to the study by Ngoc Thu (2022), the proportion of rational NSAID use addressing both gastrointestinal and cardiovascular risks was 55.4% (p = 0.554).

By substituting the values into the formula, we calculate *n* = 253. Therefore, the required sample size is 253 prescriptions.

- Using the hospital's management software, outpatient prescriptions containing NSAIDs that meet the inclusion and exclusion criteria during the study period were selected.

- During the 6-month period (July–December 2024), there were 10883 prescriptions (N).

- The sampling interval was determined as k = N/n = 10883/253 ≈ 43.

- A random number *x* was selected such that 1 ≤ x ≤ k.

- The first prescription selected had the sequence number *x*. Subsequent prescriptions had the sequence numbers x + k, x + 2k, x+ 3k, x + 4k, …

With the random number *x* = 2, prescriptions were collected from July 2024 to December 2024 using systematic random sampling. Prescriptions were selected according to the inclusion and exclusion criteria until the target sample size of 253 prescriptions was reached.

2.2.2 Data collection

General characteristics of the study sample included: age, gender, patient distribution by residence, patient distribution by disease group, types of NSAIDs used, and the proportion of patients using gastroprotective agents. The proportions of patients in different gastrointestinal and cardiovascular risk groups were identified. Risk levels were assessed based on the NSAID prescribing algorithm from the Quebec Medical Association.

- Gastrointestinal risk was categorized into three groups: low, moderate, and high.

- Cardiovascular risk was assessed based on thrombotic and heart failure risks, and classified into two groups: low to moderate risk and high risk.

The appropriateness of NSAID use was evaluated based on the Quebec Medical Association's NSAID prescribing guidelines, and classified into two categories: appropriate and inappropriate.

- Appropriate: when the prescription is consistent with the patient's level of gastrointestinal and cardiovascular risk.

- Inappropriate: when the prescription does not match the patient's gastrointestinal and/or cardiovascular risk level.

2.2.3 Data analysis

The collected data were entered and processed using Microsoft Excel 2019 along with basic computational methods. Statistical analyses involved calculating the proportions of variables in the study, and the data were processed and presented as percentages.

3. RESULTS AND DISCUSSION

3.1 General characteristics of the study subjects

Table 1. General characteristics of patients in the study sample

	Characteristics	Frequency	Percentage (%)
Age group	< 60 years old	168	66.40
	≥ 60 years old	85	33.60
Gender	Female	147	41.89
	Male	106	58.10
Patient distribution by residence	Can Tho	144	56.92
	Surrounding areas	109	43.08

Patient distribution by disease group	Musculoskeletal and connective tissue diseases	149	58.89
	Respiratory system diseases	3	1.19
	Endocrine, nutritional, and metabolic diseases	4	1.58
	Ear, nose, and throat diseases	1	0.40
	Digestive system and hepatobiliary diseases	6	2.37
	Nervous system diseases	30	11.86
	Circulatory system diseases	23	9.09
	Genitourinary system diseases	17	6.72
	Eye and adnexa diseases	6	2.37
	Neoplasms	14	5.53

In this study sample, patients under 60 years old accounted for a higher proportion than those aged 60 and above. The male gender was more prevalent than female, and most patients came from Can Tho city. The majority of patients prescribed NSAIDs belonged to the musculoskeletal and connective tissue disease group, accounting for 58.89%. This result is consistent with the studies by Hoang Thi Ngoc Thu (2022) and To Ly Cuong (2024). Patients under 60 years old represented a high proportion of 66.4%, mainly laborers engaged in manual work, occupational injuries, and sedentary lifestyles, similar to the findings of Nguyen Tran Quoc Tuan (2023). Most patients came from the Mekong Delta provinces, with the majority from Can Tho city at 56.08%, indicating that Nam Can Tho University Hospital has a strong patient attraction from neighboring provinces.

Table 2. Proportion of non-steroidal anti-inflammatory drugs used in the study sample

Category	NSAIDs	Frequency (n)	Percentage (%)
Non-selective (inhibit both COX-1 and COX-2)	Diclofenac	10	3.95
	Ibuprofen	7	2.77
	Ketoprofen	10	3.95
	Piroxicam	13	5.14
Preferential COX-2 inhibition over COX-1	Etodolac	1	0.40
	Meloxicam	116	45.85
	Celecoxib	28	11.07

Selective COX-2 inhibitors (Coxibs)	Etoricoxib	68	26.88
Total		253	100

A total of 8 NSAIDs were prescribed. Among these, meloxicam accounted for the highest proportion at 45.85%, followed by etoricoxib at 26.88%. Both meloxicam and etoricoxib belong to the selective COX-2 inhibitor group. These results are consistent with the study by To Ly Cuong (2024).

Table 3. Percentage of patients using gastroprotective drugs

Category		Frequency (n)	Percentage (%)
Used	Esomeprazol	22	8.70
	Lansoprazol	20	7.91
	Omeprazol	13	5.14
	Pantoprazol	32	12.65
Not used		166	65.61
Total		253	100

The proportion of patients prescribed gastroprotective agents accounted for 34.39%, which is lower than the proportion of patients not using gastroprotective medication. Among the gastroprotective drugs prescribed, pantoprazole was the most commonly used, accounting for 12.65%. These results indicate that the use of gastroprotective agents has not been adequately prioritized.

3.2 Evaluation of gastrointestinal and cardiovascular risk levels associated with the use of non-steroidal anti-inflammatory drugs

Table 4. Gastrointestinal and cardiovascular risk levels associated with the use of non-steroidal anti-inflammatory drugs

Gastrointestinal risk	Cardiovascular risk		Total
	Low to moderate (n)	High (n)	
Low	162 (64.03%)	0 (0%)	162 (64.03%)
Moderate	61 (24.11%)	21 (8.30%)	82 (32.41%)
High	7 (2.77%)	2 (0.79%)	9 (3.56%)
Total	230 (90.91%)	23 (9.09%)	253 (100%)

The study results showed that the proportion of patients with low to moderate gastrointestinal and cardiovascular risk was 88.14%. Patients with high gastrointestinal and cardiovascular risk

accounted for 0.79%. These findings are consistent with the studies by Hoang Thi Ngoc Thu (2021) and Lanas A (2010). Our study also analyzed the distribution of NSAID groups according to gastrointestinal and cardiovascular risk levels. In both cases, NSAIDs with preferential COX-2 inhibition and selective COX-2 inhibitors were prescribed more frequently than non-selective NSAIDs.

Table 5. Proportion of non-steroidal anti-inflammatory drug groups used according to gastrointestinal risk levels

Risk Factor	Risk Level	Non-Selective Group		Preferential COX-2 Inhibition group		Selective COX-2 Inhibitor group		Total
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Gastro intestinal risk	Low	31	12.25	65	25.69	66	26.09	162
	Moderate	7	2.77	48	18.97	27	10.67	82
	High	2	0.79	4	1.58	3	1.19	9
Total								253

The proportion of patients with low gastrointestinal risk prescribed NSAIDs from the preferential COX-2 inhibition group and the selective COX-2 inhibitor group was nearly equal, at 25.69% and 26.09%, respectively. Patients with moderate gastrointestinal risk were most frequently prescribed NSAIDs from the selective COX-2 inhibitor group, accounting for 18.97%. Patients with high gastrointestinal risk were prescribed NSAIDs less frequently, mainly from the preferential COX-2 inhibition group.

Table 6. Proportion of non-steroidal anti-inflammatory drug groups used according to cardiovascular risk levels

Risk factor	Risk level	Non-selective group		Preferential COX-2 inhibition group		Selective COX-2 inhibitor group		Total
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Frequency (n)	
Cardiovascular rish	Low to Moderate	39	15,42	106	41,90	85	33,60	230
	High	1	0,40	11	4,35	11	4,35	23
Total								253

Patients with low to moderate cardiovascular risk were mainly prescribed NSAIDs from the preferential COX-2 inhibition group, accounting for 41.90%. Patients with high cardiovascular risk were prescribed NSAIDs from both the preferential COX-2 inhibition group and the selective COX-2 inhibitor group equally, each accounting for 4.35%.

3.3 Evaluation of appropriateness in the use of non-steroidal anti-inflammatory drugs

Table 7. Proportion of appropriate use of non-steroidal anti-inflammatory drugs based on indications according to gastrointestinal and cardiovascular risk levels

Gastrointestinal appropriateness	Cardiovascular appropriateness		Total
	Appropriate (n)	Inappropriate (n)	
Appropriate	190 (75.10%)	18 (7.11%)	208 (82.21%)
Inappropriate	2 (0.79%)	43 (17.00%)	45 (17.79%)
Total	192 (75.89%)	61 (24.11%)	253

The proportion of appropriate NSAID use according to gastrointestinal risk was 82.21%, and according to cardiovascular risk was 75.89%. These results indicate that risk assessment for each individual factor is still given attention. However, the proportion of appropriate NSAID use considering both gastrointestinal and cardiovascular risks was 75.1%, while inappropriate use for both risk factors accounted for 17%. This suggests that the assessment of combined risk levels for both factors has not been adequately prioritized.

4. CONCLUSION AND RECOMENDATIONS

The study shows that NSAID use at Nam Can Tho University Hospital primarily favored preferential and selective COX-2 inhibitors, mainly Meloxicam (45.85%) and Celecoxib (26.88%). The proportion of patients with low to moderate cardiovascular risk is 71.2%, while those with high risk accounted for 28.8%. The proportion of patients with low to moderate gastrointestinal and cardiovascular risk is 88.14%, and high risk accounted for 0.79%. The rate of appropriate NSAID use according to gastrointestinal risk is 82.21%, according to cardiovascular risk is 75.89%, and appropriate use considering both gastrointestinal and cardiovascular risks is 75%. These results highlight the importance of assessing gastrointestinal and cardiovascular risks prior to prescribing and prioritizing selective NSAIDs combined with proton pump inhibitors (PPIs) to reduce gastrointestinal complications. The study recommends conducting further multicenter studies with larger sample sizes to increase generalizability.

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