

Original Research

Prescribing pattern of COX-2 inhibitors in patients with a history of allergy to conventional NSAIDs in hospital belong to Thai Redcross Society

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Abstract

Introduction: Non-steroidal anti-inflammatory drugs (NSAIDs) are known to cause allergic reactions, particularly conventional NSAIDs [1,2]. COX-2 inhibitors may be a suitable alternative for patients with a history of conventional NSAIDs allergies [3]. This study aimed to explore the prescribing rate and pattern of COX-2 inhibitors in patients with a history of conventional NSAIDs allergies. **Method:** A retrospective descriptive study was conducted using the computerized drug allergy history database from Queen Savang Vadhana Memorial Hospital (QSMH) between January 1, 2013, and December 31, 2016. Percentage statistics were used for comparison. **Results:** Among 638 patients, the most common allergy was to ibuprofen (34.95%), and the most frequently prescribed COX-2 inhibitor was etoricoxib (34.48%). The most common type of allergy to conventional NSAIDs was angioedema (42.65%), primarily associated with ibuprofen. Non-serious adverse drug reactions (ADRs) occurred in 90.61% of cases, while serious ADRs (anaphylaxis, acute renal failure, and anaphylactic shock) accounted for 9.39%. Physician staff prescribed COX-2 inhibitors most frequently (63.75%), with the orthopedic surgery unit being the most common prescribing department (48.17%). Etoricoxib was the most frequently prescribed COX-2 inhibitor (34.48%), particularly in cases where ibuprofen was the offending agent (34.95%). This highlights its critical role in managing NSAIDs allergies. **Conclusion:** This study provides insights into the prescribing pattern of COX-2 inhibitors in patients with a history of conventional NSAIDs allergies. This information is valuable for establishing monitoring plans to ensure optimal medication safety for this patient group.

Keywords: NSAIDs allergy, prescribing pattern, COX-2 inhibitors, conventional NSAIDs

INTRODUCTION

Non-steroidal anti-inflammatory drugs (NSAIDs) are widely used to alleviate pain and inflammation in various conditions, such as rheumatoid arthritis, gout, osteoarthritis, and headaches⁴. Their mechanism of action involves inhibiting the production of prostaglandin inflammatory mediators by blocking the enzyme cyclooxygenase (COX), which converts arachidonic acid into various prostaglandins⁵. While this mechanism reduces pain and inflammation, it can also increase the risk of adverse reactions, including gastric and small intestine ulcers, heart failure, and acute renal failure^{6,7}.

This study aims to determine the prescribing rate and pattern of COX-2 selective and specific NSAIDs in patients with a history of allergy to traditional NSAIDs.

METHODS

This retrospective descriptive study analyzed data from the computerized drug allergy history database from 2013 to 2016,

using percentage statistics for comparison.

Data collection

Medical records of patients with a history of traditional NSAID allergies who were subsequently prescribed COX-2 selective and specific NSAIDs were reviewed. The data was obtained from the drug allergy history records in the computer program of Queen Savang Vadhana Memorial Hospital (QSMH) between January 1, 2013, and December 31, 2016.

Population

The study included outpatients and inpatients admitted to Somdet Phra Boromratchathewi Na Sriracha Hospital with a history of traditional NSAID allergies recorded in the QSMH computer program.

Inclusion criteria

Outpatients and inpatients with a history of allergy to one or more traditional NSAIDs.

Exclusion criteria

Patients with incomplete follow-up or insufficient information in their medical records.

Data analysis

Outcomes were reported as percentages, including the number of patients who received COX-2 inhibitors and the type and prevalence of allergies or adverse drug reactions (ADRs).

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RESULTS

The study identified 638 patients with a history of allergic reactions to traditional NSAIDs. Of these, 358 prescriptions (43.7%) were for COX-2 inhibitors, averaging 1.8 prescriptions per person. (Table 1) Etoricoxib was the most frequently prescribed COX-2 inhibitor (34.48%), particularly in cases where ibuprofen was the offending agent (34.95%), as shown in Table 1. The most common type of allergy was angioedema (42.65%), primarily associated with ibuprofen. (Table 2) ADRs were categorized as non-serious (90.61%) or serious (9.39%), with the latter including anaphylaxis, acute renal failure, and anaphylactic shock. (Table 3). Physician staff were responsible for the majority of COX-2 inhibitor prescriptions (63.78%), (Table 4) with the orthopaedic surgery unit being the most frequent prescribing department (48.17%). (Table 5)

DISCUSSION

The findings suggest that physicians are familiar with guidelines for using NSAIDs in patients with a history of traditional NSAID allergies. These guidelines recommend the use of COX-2 inhibitors with direct observation for safety⁸. The manifestations of traditional NSAID allergies observed in this study are consistent with previous studies and case reports.

the prevalence of angioedema (42.65%) as the most common type of allergy associated with ibuprofen⁹⁻¹¹.

The high prescription rates among physician staff and the orthopedic surgery unit indicate that these groups should be prioritized for education on the efficacy and safety monitoring of COX-2 inhibitors. The significant prescription rate of COX-2 inhibitors by orthopedic surgery units (48.17%, Table 5) underscores the need for targeted education in these departments to reinforce safety protocols and improve patient outcomes. Given that serious adverse drug reactions (9.39%) such as anaphylaxis were reported, implementing strict monitoring guidelines during COX-2 administration is essential to enhance patient safety

This study has some limitations, including potential inaccuracies in the allergy history data due to the retrospective nature of the study. Future prospective studies are recommended to provide more accurate data for evaluation.

CONCLUSION

This study provides valuable insights into the prescribing pattern of COX-2 inhibitors in patients with a history of conventional NSAID allergies. The information can be used

Table 1. Demographics of study participants			
	Category	n	% age
Age (Years) *	less than or 25	192	34.8
	26-35	185	33.6
	36-45	107	19.4
	46-55	43	7.8
	More than or 55	24	4.4
Gender	Male	219	39.7
	Female	332	60.3
Income (SAR**)	Less than or 3000	230	41.7
	3001-5000	69	12.6
	5001-10,000	101	18.3
	10,001-20,000	131	23.7
	More than 20,000	20	3.7
Educational level	Below secondary	21	3.6
	Secondary	111	20.1
	Bachelor	286	51.9
	Graduation	53	9.6
	Other (Diploma)	80	14.5
Employment status	Employed	301	54.6
	Students	136	5.8
	Retired	32	24.7
	Unemployed	82	14.9
Nationality	Saudi	540	98
	Non-Saudi	11	2



Type of allergy	Ibuprofen	Diclofenac	Mefenamic acid	Naproxen	Aspirin	Indomethacin	Ketorolac	total
1. MP rash	10	8	1	2	1	0	0	22 (16.18%)
2. Angioedema	23	14	6	7	1	6	1	58 (42.65%)
3. Urticaria	9	3	1	0	0	0	0	13 (9.56%)
4. Rash	4	3	1	2	0	0	0	10 (7.35%)
5. Anaphylaxis	4	6	0	0	1	0	0	11 (8.09%)
6. Anaphylactic shock	0	2	0	0	0	0	0	2 (1.47%)
7. Bronchospasm	1	0	0	0	0	0	0	1 (0.7%)
8. Hepatitis	1	0	0	0	0	0	0	1 (0.7%)
9. Acute Renal failure	1	0	0	1	0	0	0	2 (1.47%)
10. Other eg Breathing difficulties	2	5	3	2	3	1	1	17 (12.5%)
Total	55	41	12	14	6	6	2	136

Allergic symptoms	Total Events (%)
Non-serious ADR	743
1. Angioedema, eyelid oedema, face oedema, lip swelling, eye irritation, numbness oral, paresthesia	200 (24.39%)
2. MP rash, rash, rash acne form	109 (13.29%)
3. Urticaria	56 (6.83%)
4. Itching, pruritus	45 (5.49%)
5. Erythema annulare, erythema multiforme	24 (2.93%)
6. Asthma, Breathing difficult, Bronchospasm, Chest discomfort	18 (2.19%)
7. Hepatitis	16 (1.95%)
8. Fixed Eruption	5 (0.61%)
9. Creatinine kinase increase	4 (0.49%)
10. Other eg agitation, palpitation, chills, diarrhea, sore throat	
Serious ADR	77
1. Anaphylaxis	58 (7.07%)
2. Hepatitis	16 (1.95%)
3. Acute Renal failure	3 (0.37%)
4. Creatinine kinase increase	58 (7.07%)
5. Anaphylactic shock	16 (1.95%)
Total Events (%)	820 (100%)

Prescriber	N (%)
1. Staffs	523 (63.78%)
2. Doctor use capital	295 (35.98%)
3. Extern	1 (0.12%)
4. Nurse	1 (0.12%)
Total	820 (100.00%)

Table 5: The number of prescribing Cox-2 inhibitors to patient who had history of classical NDAIDs hypersensitivity classified by unit in the hospital

Unit	N (%)
Orthopaedic surgery	395 (48.17%)
Rheumatology clinic	99 (12.07%)
Medical supply and procurement	99 (12.07%)
Social security	50 (6.10%)
Internal medicine	22 (2.68%)
Neurology	17 (2.07%)
General surgery	16 (1.95%)
Others	122 (14.88%)
Total	820 (100.00%)

to establish effective monitoring plans for this patient group, ensuring optimal medication safety.

Data curation and Formal analysis, Karunrat Tewthanom: Data analysis, first draft manuscript writing and submission, *All authors: Review and Editing the manuscript.

AUTHOR CONTRIBUTIONS

Karunrat Tewthanom and Kessada Tunwongsa: Conceptualization, Supervision, Project Administration, Kessada Tunwongsa: Methodology and Investigation, Karunrat Tewthanom designed methodology, Kessada Tunwongsa:

COMPETING INTEREST

The authors declare no financial or non-financial conflicts of interest.

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