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Research Article

Assessment of Prescription Pattern of Non-steroidal anti-inflammatory drugs in Iraqi Patients with Osteoarthritis

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Abstract

Aims: to give a thorough overview of the condition of Osteoarthritis management in Iraq today, with a focus on NSAID prescription trends. Additionally, the study will look at the variables, such as patient characteristics, the severity of the condition, and healthcare professional preferences, that affect the decision to use pharmacological therapies. This research paper will also examine the use of non-pharmacological therapies among Iraqi patients in the context of the difficulties associated with managing Osteoarthritis and evaluate their influence on NSAID prescription trends.

Materials and Methods: A cross-sectional, observational study was carried out from January to June 2023. Data were collected from rheumatology consultation clinics at an urban hospital and five rheumatology outpatient clinics within An-Najaf governorate, Iraq. Additionally, data collection occurred through general care practitioners at two rural hospitals. A total of 355 individuals who were over the age of 40 and had been diagnosed with Osteoarthritis were included. A standardized questionnaire was used to gather information on the demographics, clinical characteristics, comorbidities, and medication history of the patient. Based on the frequency and proportion of various medications, doses, and durations, prescription trends for NSAIDs were examined. Clinical recommendations, contraindications, and probable medication interactions were taken into consideration.

Results: NSAID use was reported in 253(71.3%) of the study population. The majority of patients were prescribed NSAIDs within the advised dose range: 47(95.2%) for naproxen, 73(91.3%) for diclofenac, and 86 (87.6%) for ibuprofen prescriptions, patients who employed non-pharmacological therapies, such physical therapy and weight-loss program, made up a sizeable section 202(56.9%) of the research population. NSAID selection was markedly correlated with patient-specific characteristics such as older age (OR: 1.04, 95% CI: 1.01-1.07, p=0.008), OA severity (Osteoarthritis: 1.97, 95% CI: 1.23-3.15, p=0.004), and the presence of comorbidities (OR: 2.13, 95 percent CI: 1.29-3.51, p=0.003).

Conclusion: The findings reinforce the necessity of adhering to clinical guidelines when prescribing NSAIDs to patients with OA and highlight the significance of non-pharmacological therapies as a component of an all-inclusive OA care strategy.

Keywords: Osteoarthritis, NSAID prescription trends, non-pharmacological therapies, pain management, and clinical practice.

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Abbreviations

OA: Osteoarthritis

Introduction

Osteoarthritis (OA) poses a significant public health concern in Iraq, with a rising incidence of joint-related disorders. Understanding prescription pattern of non-steroidal anti-inflammatory drugs (NSAIDs) is crucial for optimizing therapeutic approaches and addressing unique healthcare challenges faced by Iraqi patients with osteoarthritis. Osteoarthritis (OA) is a long-term, degenerative joint disease characterized by remodeling of the subchondral bone, inflammation of the synovial membrane, and progressive loss of articular cartilage, all of which contribute to pain, stiffness, and reduced function in the affected joints [1]. OA is a major contributor to disability worldwide and is more common among females and the aged populations [2, 3]. OA has a considerable economic impact on both individuals and healthcare systems, with yearly costs related to OA in the United States close to $200 billion [4]. In the United Arab Emirates, research conducted on various OA patients' groups, revealed that the annual healthcare expenses per each patient was around $350 [5]. In Middle East and North Africa (MENA) region, 24.6 million cases of OA were reported in 2019, with an overall age-standardized prevalence of 5.34%. Remarkably, Saudi Arabia experienced a high prevalence at 6.60%, while Kuwait and Iran also showed significant rates of 5.63% and 5.59%, respectively. On the other hand, Iraq 5.04%, Yemen 4.77%, and Afghanistan 4.87% recorded the lower end of OA prevalence [3]. The increasing prevalence of OA suggests a greater impact on public healthcare systems and upcoming medical services [6]. In order to reduce pain, improve joint function, and enhance patients' quality of life, OA treatment often combines pharmacological and non-pharmacological methods [7]. Due to their analgesic and anti-inflammatory actions, non-steroidal anti-inflammatory medications (NSAIDs) are widely used to treat OA symptoms [8]. However, NSAIDs have a number of side effects, including kidney dysfunction, cardiovascular risks, and gastrointestinal (GI) issues, which may limit their long-term usage in OA patients [9]. The patient's age, comorbidities, and any drugs they are currently taking must all be considered when evaluating the effectiveness and safety profile of NSAIDs [10]. Although studies suggest caution in using NSAIDs, there is no information on how often these medications are prescribed to OA patients in Iraq. With a focus on the appropriateness of prescribed drugs, doses, and durations as well as the incidence of potential drug interactions and contraindications, this research study intends to assess the prescription pattern of NSAIDs in Iraqi patients with OA. Acetaminophen, opioids, and intra-articular corticosteroid injections are some other pharmaceutical therapies for OA in addition to NSAIDs. These complementary therapies may be useful in treating the symptoms of OA, but they all have significant drawbacks and limitations. For instance, opioids are linked to addiction and respiratory depression whereas acetaminophen may induce liver damage [11-12]. Intra-articular corticosteroid injections might offer short-term relief, but continued usage over time could accelerate cartilage deterioration [13]. As a result, choosing the best course of therapy for OA patients necessitates a complete comprehension of the advantages and disadvantages of each choice. In the thorough care of OA, non-pharmacological measures including physical therapy, weight control, and assistive gadgets are also very important [14]. These approaches may lessen the need for pharmaceutical therapies and the negative side effects that go along with them. However, due to resource shortages and insufficient healthcare infrastructure, access to non-pharmacological therapies may be restricted in some areas, including Iraq [15]. The study aims at exploring prescription trends of NSAIDs in Iraqi OA patients, aiming to assess their prevalence and implications for patient management, also, to examine frequency of NSAID prescriptions and utilization of non-pharmacological interventions. This research will help create evidence-based guidelines for treating OA in Iraq and other places with comparable healthcare systems, improving patient outcomes and lessening the burden of this crippling illness.

Material and methods

Study Design and Setting

A cross-sectional, observational study covered both urban and rural parts of Iraq and was carried out from January to June 2023. It focused on Al-Sader Teaching Hospital in An-Najaf's urban center, where rheumatology specialists at consultation clinics diagnosed patients. Additionally, in rural regions, data were collected from general care practitioners at Al-Haydaria and Al-Manathera General Hospitals. The study also comprised five rheumatology outpatient clinics located in the center of An-Najaf. This diverse setting ensures our findings are representative of both urban and rural healthcare in Iraq. All study participants provided informed consent prior to enrolment, and the study methodology was approved by the Scientific Committee of the Clinical Pharmacy Department at the Faculty of Pharmacy, University of Kufa. The approval was granted on December 14, 2022, under the registration number #102.

Study Population and Sampling

The research included Iraqi individuals over the age of 40, who had a confirmed diagnosis of OA according to their medical records. Patients with significant comorbidities or other rheumatic conditions that would make it difficult to evaluate prescription patterns were not included. Participants were chosen using a stratified random selection technique, assuring a balance of gender, age, and regional representation. The sample size was calculated using the formula for cross-sectional studies:

$n = Z^2 * P * (1-P) / E^2$

where P is the expected percentage of NSAID usage in the OA population, n is the necessary sample size, Z is the Z-score for the appropriate confidence level (1.96 for a 95 percent confidence interval), and E is the margin of error. We presumed a prevalence of NSAID usage of 70% (P= 0.7) and a margin of error of 5% (E = 0.05) based on prior research [4]. A total of 355 patients were included in the study after 323 participants, the projected sample size, and a 10% non-response rate were taken into consideration.

Data Collection

Participants' age, sex, education, employment, clinical parameters (disease duration, afflicted joints, and severity of OA), comorbidities, and medication history were all gathered using a standardized questionnaire. Medical records were consulted to validate information on prescriptions of NSAIDs (drug, dose, duration, frequency), and concurrent drugs. In addition to patient characteristics, variables specific to the prescriber may also affect how frequently NSAIDs are prescribed. To look into the possible influence of these variables on NSAID prescription decisions, data on the demographics, specialization, and years of experience of healthcare practitioners were gathered. This study may identify certain prescriber-related issues that require addressing through focused educational initiatives or attempts to disseminate guidelines. The data gathering process involved a total of nine individuals. This team comprised three researchers and six clinical pharmacists. The three researchers were directly involved in the study's design, implementation, and analysis phases. In contrast, the six clinical pharmacists, all of whom were actively working in the hospitals from which the data were collected. All data gatherers had training on the research protocol, how to utilize the structured questionnaire, and how to extract data from medical records in order to guarantee data consistency and correctness. The validity of the questionnaire and the data collecting methods were tested in a pilot study, and adjustments were made as necessary. Two different researchers entered the data, and disagreements were settled by conversation and examination of the original data. Patients with OA frequently use many analgesics at once, which may affect how frequently NSAIDs are prescribed. Therefore, the study looked at the use of additional analgesics together with NSAIDs, including acetaminophen, opioids, and intra-articular corticosteroids. The study aims to give a more thorough grasp of the overall pain management tactics used in this group by comprehending the combination of analgesics supplied to OA patients. Along with examining NSAID prescription trends, non-pharmacological intervention usage was evaluated. Patients' participation in physical therapy, weight-management plans, and usage of assistance like braces or walking sticks were all questioned. The duration and frequency of non-pharmacological interventions were assessed, as well as the degree of patient satisfaction with these therapies.

Data Analysis

The research population's clinical and demographic characteristics were summed together using descriptive statistics. Based on the frequency and proportion of various medications, doses, and durations, the prescription trends for NSAIDs were examined. Stratified analyses based on these clinical and demographic variables were conducted to explore NSAID prescription patterns across patient subgroups. This approach identified particular trends or differences, informing targeted OA management recommendations. Clinical recommendations, contraindications, and probable medication interactions were taken into consideration when assessing how suitable a prescription was [16, 17]. To determine the variables influencing the decision to use NSAIDs and non-pharmacological therapies, logistic regression analysis was used. The significance threshold for each statistical analysis was established at $p<0.05$ using SPSS software (version 26.0, IBM Corp., Armonk, NY).

Ethical Considerations

All study participants provided written informed consent prior to enrolment, and the study methodology was approved by the Scientific Committee of the Clinical Pharmacy Department at the Faculty of Pharmacy, University of Kufa. The approval was granted on December 14, 2022, under the registration number #102. Throughout the study, the privacy of participants' personal and medical information was upheld, and data were stored in a secure database that was only available to approved researchers.

Results

Descriptive Data of Patients

The research comprised 355 participants with OA in total. The participants' mean age was 61.3±9.2 years, and 228 (64.2%) of them were female. The majority of the patients 318 (89.5%) had primary OA, and the illness had been present for an average of 7.3±3.8 years. Knees 275(77.5%), hips 161(45.6%), and hands were the next most often afflicted joints thereafter 115(32.4%). The majority of comorbidities, hypertension 123(34.9%) and diabetes mellitus 101(28.7%), were present in 224(63.1%) patients overall, Tables (1).

Table 1: Descriptive Data of Patients

Characteristics		N	%
Gender	Male	127	35.8%
	Female	228	64.2%
Type or Site of disease	Primary OA	318	89.6%
	Knees	275	77.5%
	Hips	161	45.6%
	Hands	115	32.4%
Comorbidities	Hypertension	123	34.9%
	Diabetes Mellitus	101	28.7%

Variables Related to the Use of NSAIDs

NSAIDs usage was reported by 253(71.3%) of the research participants. Ibuprofen 98(38.9%), diclofenac 81(32.1%), and naproxen 49(19.4%) were the most often used medications among the recommended NSAIDs. The majority of patients got NSAIDs in the recommended dose range, with 86(87.6%) of prescriptions for ibuprofen, 73(91.3%) for diclofenac, and 47(95.2%) of prescriptions for naproxen falling within the

range. 164(64.8%) of patients used NSAIDs for fewer than 12 weeks, with the average NSAID therapy lasting 12.6±7.8 weeks, Table (2). This table also describes the appropriateness of prescriptions, where potential drug interactions were found in 31(12.4%) of individuals using NSAIDs; the most frequent were those caused by taking NSAIDs and antihypertensive drugs together 25(9.8%). Patients with NSAIDs contraindications were 22(8.7%), which included individuals with a history of stomach ulcers 13(5.1%) and renal impairment 9(3.6%).

Table 2: Variables Related to the Use of NSAIDs

Variables related to NSAIDs use		N	%
NSAIDs	Ibuprofen	98	38.9%
	Diclofenac	81	32.1%
	Naproxen	49	19.4%
Prescriptions within recommended dose range	Ibuprofen prescriptions	86	87.6%
	Diclofenac prescriptions	73	91.3%
	Naproxen prescriptions	47	95.2%
Appropriateness of Prescriptions	Potential drug interactions	31	12.4%
	Antihypertensive medications	25	9.8%
Contraindications to NSAID	History of stomach ulcers	13	5.1%
	History of renal impairment	9	3.6%
	Total	22	8.7%

Non-Pharmacological Interventions

Non-pharmacological therapies were reported to have been used by 202(56.9%) patients. The most frequent intervention was physical therapy in 83(41.1%), followed by weight control plans 57(28.5%) and assistive equipment 40(19.7%). A 73.4% of individuals who employed non-pharmacological therapy expressed moderate to high satisfaction with their care, Table (3).

Non-Pharmacological Interventions	N	%
Physical therapy	83	41.1%
weight management programs	57	28.5%
Assistive devices	40	19.7%
Total non-pharmacological interventions	202	56.9%
High level of satisfaction with these treatments	148	73.4%

Factors Associated with NSAID Use

The results of a logistic regression analysis showed that the use of NSAIDs was significantly correlated with older age (OR: 1.04, 95% CI: 1.01-1.07, p=0.008), greater OA severity (OR: 1.97, 95% CI: 1.23-3.15, p=0.004), and the presence of comorbidities (OR: 2.13, 95 percent CI: 1.29-3.51, p=0.003). Neither contemporaneous analgesic usage nor characteristics linked to the prescriber were shown to be significantly associated with NSAID use, Table (4).

Table 4: Factors Associated with NSAID Use

Factors Associated with NSAID	OR	95% CI	P value
Older age	1.04	1.01-1.07	0.008
Higher OA severity	1.97	1.23-3.15	0.004
Comorbidities	2.13	1.29-3.51	0.003

Subgroup Analysis

According to the stratified study, different patient categories had different prescription trends for NSAIDs, when compared to individuals under 65, patients aged 65 and older used COX-2 selective medicines such celecoxib and etoricoxib more frequently 20(22.6%) than younger ones 26(15.8%). Ibuprofen was prescribed to female patients in a higher percentage than to male patients, 68(42%) vs. 30(33.5%) respectively, while diclofenac was given to male patients more often 33(36.2%) as compared to female patients 48(29.8%). Patients with severe OA used naproxen more commonly 36(23.1%) than those with moderate OA 13(16.4%), Table (5).

Table 5: Subgroup Analysis

Subgroup	N	%
Celecoxib, etoricoxib (≥65 years)	20	22.6%
Celecoxib, etoricoxib (<65 years)	26	15.8%
Female patients (receive ibuprofen)	68	42.%
Male patients (receive ibuprofen)	30	33.5%
Male patients (receive diclofenac)	33	36.2%
Female patients (receive diclofenac)	48	29.8%

Severe OA (receive naproxen)	36	23.1%
Moderate OA (receive naproxen)	13	16.4%

Prescriber-Related Factors and concurrent Analgesic Use

There were no connections between NSAID prescription trends and characteristics relevant to the prescriber, such as specialty or years of experience. However, there was a tendency to see more COX-2 selective inhibitors prescribed by rheumatologists 18.5% compared to general practitioners 12.9%. In addition to NSAIDs, 123(48.7%) of patients also took concomitant analgesics. The most often co-prescribed analgesic was acetaminophen 92(36.3%), followed by opioids 20(7.9%) and intra-articular corticosteroids 11(4.5%).

Discussion

The results of this study showed significant differences in the prescription patterns for NSAIDs among various patient subgroups and underlined the significance of taking into account patient-specific factors, such as age, gender, disease severity, and comorbidities, when prescribing NSAIDs for the management of OA [10]. According to our findings, which are partially consistent with those from other countries [18], non-selective NSAIDs like ibuprofen 38.9% and diclofenac 32.1% were the most often recommended medications for OA patients in Iraq. However, this result does not go well with an Indian study, where the prescription rate of ibuprofen and diclofenac were 3% and 5%, respectively [19]. On the other hand, older patients were more likely to take COX-2 selective inhibitors, presumably indicating that prescribers were aware of the higher risk of gastrointestinal side effects associated with non-selective NSAIDs in these populations [20]. A comparable outcome was found by Cho et al, where the majority of COX-2 selective inhibitor users were elderly patients [21]. This research also brought attention to the frequent use of analgesics taken concurrently, notably acetaminophen 36.3%, which is suggested as the first-line pharmacological therapy for OA by many clinical recommendations [22]. Similarly, acetaminophen was reported as the most commonly prescribed co-analgesic for OA patients in an earlier study carried out in France, with a prescription rate of 63% [23]. Given their possible negative effects and poor long-term effectiveness, prescribers in Iraq may be wary of utilizing these medications, as seen by the comparatively low co-prescription of opioids (7.9%) and intra-articular corticosteroids 4.5%. This finding is also revealed by a previous study, which noted a low prescription rate for opioids 3.3% and intra-articular steroids [24]. It's interesting that no links between NSAID prescription trends and prescriber-related variables, including specialty or years of experience, were discovered. Rheumatologists did, however, tend to prescribe COX-2 selective inhibitors more frequently than general practitioners do. This conclusion may be related to the rheumatologists' perceived benefits in terms of safety as well as their higher expertise with OA care recommendations and probable predilection for COX-2 selective inhibitors [25]. The study evaluated the utilization of non-pharmacological therapies that are suggested as crucial elements in managing OA [26], including physical therapy, weight management programs, and assistive gadgets. Our research indicates that these interventions were underused in the study group, emphasizing the necessity of raising knowledge and promoting non-pharmacological treatment options among patients and healthcare professionals. Conversely, two prior studies illustrated those non-pharmacological interventions particularly physical therapy and weight control regimens were highly utilized treatment modalities [27, 28]. Electronic health record (EHR) systems with prescription pattern monitoring capabilities integrated may make it easier for healthcare professionals to see patterns, potential medication interactions, or contraindications in real-time, improving patient safety and treatment results [29]. In the context of managing OA, where NSAID usage over an extended period of time may pose serious concerns, our study highlights the potential advantages of adopting such tools into normal clinical practice. The results of this study may help formulate methods to maximize the use of NSAIDs in patients with OA while lowering related risks. They will also provide insightful information on current clinical practice in Iraq. This research has several limitations. First, the cross-sectional design makes it impossible to determine if patient characteristics and prescription patterns are causally related. Second, the use of patient reports and medical records may be biased by recollection and misclassification. The study was only done in a few hospitals and outpatient clinics, so it's possible that the results don't apply to all OA patients in Iraq.

Conclusion

The current study analyzed the use of non-pharmacological therapies as well as the prescription patterns of NSAIDs for OA in Iraqi patients. The results showed that NSAID usage was quite prevalent in this group, with some variations in the suitability of drugs, doses, and durations. The study also discovered that a substantial percentage of patients were utilizing non-pharmacological therapies, such as physical therapy and weight-management programs, suggesting a rising understanding of the significance of multimodal approaches to the management of OA. The findings of this study have a number of consequences for Iraqi clinical practice. Healthcare professionals should be mindful of the possible risks related to NSAID usage and make an effort to follow clinical recommendations for drug selection, doses, and duration.

Recommendations

This study emphasizes how critical it is to integrate prescription pattern analysis into everyday clinical practice. Electronic health record (EHR) systems that incorporate prescription pattern monitoring technologies may enable medical professionals to see patterns, potential medication interactions, or contraindications in real-time, enhancing patient safety and treatment effectiveness. Future research should focus on longitudinal studies with long-term follow-up to evaluate how NSAID prescription patterns affect patient outcomes including pain alleviation, functional improvement, and quality of life. Such studies can assess the long-term risks of NSAID usage as well as the efficiency of non-pharmacological measures in lowering the need for pharmaceutical therapies.

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Authorship

Zaid Fakhrulddin: data collection, statistical analysis, results, discussion, draft writing Amina Jabri: data collection, revision, statistical analysis, results, discussion, draft writing Dunya Shnain: Main idea and critical revision, data collection

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