

**ASSESSMENT OF DRUG PRESCRIPTION PATTERN FOR  
OSTEOARTHRITIS PATIENTS IN A TERTIARY LEVEL HOSPITAL: A  
PROSPECTIVE OBSERVATIONAL STUDY FROM INDIA**

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**ABSTRACT**

**Background and Objectives:** Osteoarthritis (OA), which mostly affects lower extremity joints like the knee and hip and significantly impairs elderly people, is a key contributor to chronic pain. The primary goals of OA treatment are to improve mobility and reduce discomfort. Non-steroidal anti-inflammatory drugs (NSAIDs) are often used to treat symptoms despite their negative side effects. The need for safe and effective alternative medicines that could offer OA patients benefits for both symptomatic alleviation and disease-modifying outcomes remains, nevertheless. The purpose of this study was to evaluate the prescription patterns and their rationality in OA patients.

**Materials & methods:** A prospective cross-sectional was carried out study that included all newly diagnosed and previously treated OA patients. The study enrolled about 400 patients, whose prescriptions were examined. The data was examined using descriptive statistics, which were then presented as percentages.

**Results:** In comparison to males, almost twice number of women had OA. The most frequently affected joints were knee and hip. The most frequently used NSAIDs among the patients were

aceclofenac and diclofenac, whereas piroxicam received the fewest prescriptions. The most frequently used adjuncts in the treatment of OA patients were gastro protective medications, calcium supplements, and SYSDOA (symptomatic slow-acting drugs for OA).

**Conclusion:** Although NSAIDs are preferred, SYSDOA and non-pharmacological therapy including alterations in lifestyle and regular light exercise have altered the course of OA treatment.

**Key words:** Osteoarthritis, Knee, Non-Steroidal Anti-Inflammatory Agents, Prescriptions, SYSDOA.

## **INTRODUCTION**

Osteoarthritis (OA) represents a prevailing progressive degenerative ailment characterized by the erosion of articular cartilage and subchondral sclerosis, accompanied by modifications in the synovium [1]. Recent reports from the World Health Organization indicate that the global prevalence of OA among individuals aged 60 years and above is approximately 9.6% for men and 18% for women. In India, the occurrence of OA is more prevalent among women, with a prevalence rate ranging from 22% to 39%. Notably, radiological evidence of OA is observed in roughly 70% of women aged 65 years and above, while approximately 45% of women exhibit symptomatic manifestations of OA [2].

Although OA can affect both upper and lower extremities, it primarily impacts the lower extremities, notably the knee and hip joints. The risk of developing OA is amplified twofold in individuals with obesity, and projections indicate that by 2030, approximately 30% of the population may experience symptomatic OA. Furthermore, factors such as stress, injuries, and physically demanding occupations contribute to an increased susceptibility to OA, although advanced age remains the primary determinant [3].

The primary objectives of treatments for OA encompass pain alleviation, reduction in stiffness, preservation of functional abilities, and enhancement of overall quality of life. Various therapeutic

approaches are employed, including non-pharmacological interventions such as physical therapy and patient education, pharmacological interventions involving the use of analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), and slow-acting medications for OA symptoms (SYSADOAs), as well as surgical procedures such as orthopedic joint replacement [4,5].

A range of non-steroidal anti-inflammatory drugs (NSAIDs), and in rare cases, opioids, are employed in the treatment of OA. However, the excessive use of pharmaceutical interventions can lead to adverse drug reactions, escalated medical costs, and prolonged hospital stays. In line with current recommendations, acetaminophen is suggested as the initial analgesic of choice, while the efficacy of medications falling under the SYSADOA class remains uncertain. Notably, polypharmacy emerges as a significant but often overlooked concern in this patient population. Reports indicate that polypharmacy poses a substantial risk of "potentially improper prescribing," which can significantly impact healthcare expenditures. Hence, it can be employed as a prompt and accurate measure to evaluate the quality of older individuals' medication utilization [6].

In light of the considerable socioeconomic impact of OA in our nation, there exists a scarcity of studies examining the patterns of drug utilization in this condition [7]. Given the wide array of medications employed for OA management and the necessity for long-term palliative treatment, it becomes imperative to comprehend the prescribing patterns through drug utilization studies. Consequently, the primary objective of our study was to evaluate the patterns of drug utilization in OA. The intent behind this study was to inform clinicians about the utilization of medications in OA treatment, particularly in relation to existing guidelines, and to assess the prescribing practices adopted by clinicians.

## **MATERIAL & METHODS**

The study was conducted at a tertiary care center located in central India. The inclusion criteria encompassed both newly diagnosed and previously diagnosed patients with OA who sought medical

attention at the orthopedics department over duration of six months. All individuals of both genders aged 18 years or above, who expressed willingness to participate, were considered eligible for inclusion. The sole exclusion criterion was the unwillingness of patients to take part in the study. A total of 421 patients were carefully selected for inclusion based on a thorough assessment of the predefined inclusion and exclusion criteria. Written informed consent was obtained from all participants after providing a comprehensive explanation of the study. The study was conducted according to prevalent ethical guidelines [8, 9]. The collected data were analyzed using descriptive statistics and presented in the form of percentages.

**RESULTS**

In our study, a total of 421 patients diagnosed with OA) and seeking medical care at the orthopedic outpatient department (OPD) were included over a duration of six months. The data indicated a higher prevalence of OA among females compared to males, as depicted in Table 1. The most prevalent age group affected by OA was between 51 and 60 years, accounting for 42.76% of the patients. Conversely, OA was relatively rare in the age group of 31-40 years, with a prevalence of only 11.16%, as demonstrated in Table 1. Among the affected individuals, knee OA was highly predominant, with approximately 78.62% of the patients, followed by OA of hip joint (Table 2).

**Table 1: Age and Gender distribution of OA in study population**

<b>Age group</b>	<b>Frequency</b>	<b>%</b>
31-40 years	47	11.16
41-50 years	111	26.37
51-60 years	180	42.76
> 60 years	83	19.71
<b>Gender</b>		
Male	170	40.38
Female	251	59.62

**Table 2: Distribution of joints affected by OA in study population**

<b>Joint affected</b>	<b>Frequency</b>	<b>%</b>
Knee	331	78.62
Hip	49	11.64
Spine	27	6.41
Others	14	3.33

According to the data presented in Table 3, the majority of patients were receiving combination therapy involving various non-steroidal anti-inflammatory drugs (NSAIDs). Among the prescribed drugs, diclofenac/aceclofenac was the most frequently prescribed both as immunotherapy and in combination, while piroxicam was the least commonly prescribed NSAID.

Furthermore, as depicted in Table 4, in addition to NSAIDs, a significant proportion of patients were also taking adjuvant medications such as calcium supplements and anti-ulcer medications to manage their osteoarthritis condition.

**Table 3: Drug prescribing pattern in OA patients**

<b>Medication</b>	<b>In Monotherapy (n)</b>	<b>Combination therapy (n)</b>	<b>Total</b>	<b>Percentage</b>
Aceclofenac	57	68	125	22.36
Diclofenac	25	60	85	15.21
Paracetamol	----	135	135	24.15
Nimesulide	21	8	29	5.19
Tramadol	32	----	32	5.72
COXIBs	75	6	81	14.49
Piroxicam	21	----	21	3.76
Ibuprofen	10	41	51	9.12

**Table 4: Groups of drug prescribed in OA patients**

<b>Group of drugs</b>	<b>Number of prescriptions</b>	<b>Percentage</b>
NSAIDs	496	41.05
SYSADOA	33	3.37
Vitamin supplements	81	6.68

Calcium supplements	279	22.98
Antiulcer drugs	316	26.07
Muscle relaxants	23	1.84

**DISCUSSION**

OA is recognized as one of the most prevalent inflammatory joint disorders, leading to severe pain and disability, thus presenting a significant health risk for a large portion of the Indian population. The onset of OA primarily occurs due to the release of proteoglycan and collagen fragments into the synovial fluid, resulting from the breakdown of the cartilage matrix through proteolytic processes, as well as cartilage surface fibrillation and erosion. Despite the high prevalence of OA and its substantial impact on quality of life, particularly among the elderly, the available treatments often exhibit limited efficacy [10].

In our study, we observed a significant prevalence of OA among females in comparison to males, which aligns with the findings of previous research conducted by Jadhav et al. and Ullal and Narendranath, where approximately 58-63% of patients were female [11,12]. Notably, a study by Chlebowski et al. indicated that estrogen has the ability to reduce inflammatory markers and cartilage turnover in OA, suggesting that postmenopausal women are more susceptible to developing OA [13].

In our study, we observed a higher prevalence of OA among individuals aged 51-60 years, which is consistent with findings from other studies where OA is commonly reported between the ages of 40 and 60 years. The progressive reduction in cartilage water content with advancing age makes the joints more susceptible to wear and tear. Bishnoi et al., in their study, also found a high frequency of OA within the age range of 40-60 years [14].

OA can affect various joints in the body, and in our study, knee OA was particularly common. One possible explanation for this is the excessive use of squatting and cross-leg sitting positions in Indian customs, which may contribute to the frequent involvement of the knee joints [7, 15]. In our study, it was evident that a significant proportion of patients were prescribed one or another class of non-steroidal anti-inflammatory drugs (NSAIDs), either as monotherapy or in combination with other medications. Among the NSAIDs, phenylacetic acid derivatives, specifically aceclofenac and diclofenac, were the two most commonly prescribed drugs. These findings are consistent with the study conducted by Gupta et al., which also highlighted the frequent prescription of diclofenac and aceclofenac for moderate to severe OA patients. In contrast, opioids were rarely prescribed in our study, in contrast to the findings of Akazawa et al., where opioids were prescribed in approximately 10% of patients, despite NSAIDs being the predominant choice [1, 16].

As per the recommendations of the American College of Rheumatology, acetaminophen is advised as the initial treatment option for individuals with osteoarthritis (OA) experiencing mild-to-moderate pain. However, in our study, while acetaminophen accounted for 37% of NSAID prescriptions, it was consistently used as part of combination therapy, as indicated in Table 2. This prescribing pattern could be attributed to the perceived higher efficacy demonstrated by other COX-2 inhibitors and the lack of confidence among treating physicians in the efficacy of acetaminophen when used as a monotherapy [17].

In the context of early OA, the European League Against Rheumatism and OA Research Society International recommendations advocate for the use of SYSADOA, namely glucosamine sulfate and diacerein. However, in our study, only 3.37% of prescriptions consisted of SYSDOA medications. Despite the demonstrated symptom-reducing properties and relative safety of SYSDOA medications, the low prescription rate likely reflects a lack of

confidence in their clinical and financial viability. Bruyere et al., in their study, have highlighted the extremely low toxicity of SYSDOA and its effectiveness in reducing pain and improving physical function in OA patients [18].

In our study, we observed that 26.07% of patients were prescribed anti-ulcer medications, 22.98% were prescribed calcium supplements, and muscle relaxants were prescribed as adjuvants. The majority of patients (88%) preferred oral administration of medications, while only a small percentage (12%) received drugs via topical or other routes. These findings are consistent with the studies conducted by Patil and Nara, as well as Gupta et al., which also reported a preference for the oral route of administration among over 80% of OA patients [1, 19].

## **CONCLUSION**

OA predominantly affects females and is a chronic debilitating condition. While NSAIDs have been the go-to treatment, there is a growing emphasis on non-pharmacological therapies and SYSDOAs. These approaches, including lifestyle modifications, exercise, weight loss, physiotherapy, and ultrasonic massage, reduce reliance on NSAIDs and their associated side effects. Prescription pattern studies like this promote rational drug use, create awareness among healthcare providers, and contribute to the development of a unified national drug policy, resulting in wiser drug utilization for OA management.

**Conflicts of interest:** none

**Source of funding:** none

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