

A Study of drug utilization pattern in the management of osteoarthritis in the Orthopaedic department of VMMC, New DelhiNeelu Raj¹, Rakesh Kumar², Sparsh Gupta³, Binit Singh⁴¹Senior Resident, Department of Pharmacology, Vardhman Mahavir Medical college (VMMC), New Delhi, India²Senior Resident, Department of Orthopaedics, Indira Gandhi ESI hospital, Jhilmil, Delhi, India³Professor and HOD, Department of Pharmacology, Vardhman Mahavir Medical college (VMMC), New Delhi, India⁴Specialist and HOD, Department of Orthopaedics, Indira Gandhi ESI hospital, Jhilmil, Delhi, India

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Abstract:**Background:** Osteoarthritis (OA) is a common degenerative joint disease and a major cause of morbidity among the elderly. Pharmacological management remains the mainstay for symptom relief. Periodic evaluation of prescribing patterns helps promote rational and evidence-based therapy in OA care.**Aim:** To study the drug utilization pattern in the management of osteoarthritis among patients attending the Orthopaedic Department of VMMC and Safdarjung Hospital, New Delhi.**Methodology:** This prospective, observational study was conducted over 12 months in the Orthopaedic Outpatient Department. A total of 150 clinically diagnosed OA patients were enrolled. Data on demographic profile, clinical characteristics, and details of prescribed drugs were collected using a structured case record form. WHO core drug use indicators were also assessed. Statistical analysis was performed using descriptive statistics.**Results:** A majority of patients were in the 60–69 years age group (38%), with females comprising 64% of the study population. Knee OA was the most prevalent (80%). NSAIDs were the most frequently prescribed drugs (82%), followed by paracetamol (60%), DMOADs (34%), calcium and vitamin D supplements (65%), and intra-articular corticosteroids (15%). The average number of drugs per prescription was 2.8, with 58% prescribed by generic name and 70% from the Essential Medicines List.**Conclusion:** NSAIDs continue to be the cornerstone of OA pharmacotherapy. The study highlights the importance of optimizing rational drug use, promoting generic prescribing, and aligning practice with current treatment guidelines. Regular audits and educational interventions are warranted to further improve prescribing patterns in OA management.**Keywords:** Osteoarthritis, Drug utilization, NSAIDs, DMOADs, Rational prescribing.

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Introduction

Osteoarthritis (OA) is the most prevalent chronic joint disease globally and a leading cause of pain and functional disability among the elderly. It is characterized by the progressive degeneration of articular cartilage, changes in subchondral bone, synovial inflammation, and osteophyte formation, resulting in joint pain, stiffness, and impaired mobility [1]. According to the World Health Organization (WHO), more than 10% of men and 18% of women aged over 60 years have symptomatic OA worldwide (WHO, 2023). In India, the prevalence of OA is significant, with studies suggesting that around 22% to 39% of the elderly population is affected [2]. The knee is the most commonly affected joint in Indian patients,

particularly among postmenopausal women and individuals with sedentary lifestyles [3].

The management of OA focuses primarily on symptom relief and improving the quality of life as there is currently no cure for the disease. Treatment strategies include both pharmacological and non-pharmacological interventions. Non-pharmacological approaches such as physical therapy, weight reduction, and lifestyle modifications form the cornerstone of management. However, pharmacotherapy remains the most widely used modality for symptomatic relief in clinical practice [4].

In terms of drug therapy, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are the mainstay of treatment for OA pain (Zhang et al., 2010). NSAIDs are preferred over simple analgesics because of their superior efficacy in controlling pain and inflammation, though their use is associated with gastrointestinal, renal, and cardiovascular side effects [5]. Other agents commonly used include acetaminophen, opioids (in selected cases), intra-articular corticosteroids, disease-modifying osteoarthritis drugs (DMOADs), and dietary supplements such as glucosamine and chondroitin sulfate. The use of topical NSAIDs and newer agents such as diacerein and hyaluronic acid injections is also on the rise in India [6].

Drug utilization studies are crucial in evaluating prescribing patterns, determining rationality, identifying irrational or inappropriate drug use, and promoting the safe and effective use of medicines. In the Indian healthcare context, such studies are even more relevant, given the frequent variations in prescribing trends between different regions, hospitals, and healthcare providers [7]. Furthermore, irrational prescribing, polypharmacy, and over-reliance on analgesics have been widely documented in the Indian scenario.

Despite the availability of national and international guidelines for the management of OA, such as those provided by the American College of Rheumatology (ACR, 2019) and the Osteoarthritis Research Society International (OARSI, 2022), compliance with these guidelines among clinicians is variable. Many Indian studies have reported under-utilization of non-pharmacological treatments and an over-reliance on NSAIDs without proper gastroprotective agents (Gogtay et al., 2016). Moreover, the use of alternative medicines and fixed-dose combinations without adequate evidence further complicates the situation [8].

In this context, conducting drug utilization studies at such as Vardhman Mahavir Medical College (VMMC) and Safdarjung Hospital, New Delhi, holds immense significance. Being a premier government teaching hospital with a large and diverse patient population, VMMC provides an ideal setting to assess the current prescribing trends in OA management in an urban Indian healthcare context. Previous studies from North India have indicated considerable variability in prescribing practices across different departments and between public and private sectors [9].

Moreover, rational drug use is vital for minimizing the risk of adverse drug reactions, improving patient adherence, and optimizing treatment outcomes in OA. The elderly population, which forms the bulk of OA patients, is particularly vulnerable to polypharmacy-related adverse effects [10]. Therefore, a systematic analysis of prescribing

patterns in OA management is essential to identify gaps between actual clinical practice and evidence-based recommendations [11].

Given the limited Indian data on drug utilization patterns specifically in tertiary orthopaedic settings, this study aims to fill that gap by systematically analyzing the prescribing trends for OA patients attending the Orthopaedic Department of VMMC, New Delhi. The findings of this study are expected to provide insights into current practices, highlight areas for improvement, and contribute to the rationalization of OA pharmacotherapy at both institutional and policy levels.

Methodology

Study Design: The present study was a prospective, cross-sectional, observational study conducted in the Department of Orthopaedics, Vardhman Mahavir Medical College (VMMC) and Safdarjung Hospital, New Delhi, India.

Study Duration: The study was carried out over a period of 1 year

Study Setting: The study was conducted in the Orthopaedic Outpatient Department (OPD) of VMMC and Safdarjung Hospital, a tertiary care teaching hospital in New Delhi, catering to a large and diverse patient population.

Study Population: All patients diagnosed with primary osteoarthritis of the knee, hip, or other peripheral joints attending the Orthopaedic OPD during the study period were considered for inclusion.

Sample Size: A total of 150 patients were enrolled based on convenience sampling, after obtaining informed consent.

Inclusion Criteria

- Patients aged ≥ 40 years diagnosed clinically and radiologically with primary osteoarthritis according to the American College of Rheumatology (ACR) criteria.
- Patients willing to provide written informed consent for participation in the study.

Exclusion Criteria

- Patients with secondary osteoarthritis
- Patients with severe hepatic or renal impairment.
- Patients already participating in any other clinical trial.
- Patients unwilling to provide consent.

Data Collection: After obtaining institutional ethical committee approval, data were collected using a predesigned case record form. For each patient, demographic details (age, gender, occupation), clinical profile (site of OA, duration of

symptoms, severity), and complete prescribing patterns were recorded. Prescribing details included drug name (generic and brand), dose, frequency, duration, route of administration, type of therapy (monotherapy or combination), and use of adjunctive therapies such as proton pump inhibitors, gastroprotective agents, and supplements. Additionally, WHO core drug use indicators were evaluated, including the average number of drugs per prescription, percentage of drugs prescribed by generic name, use of antibiotics and injectables (if applicable), and prescription of drugs from the Essential Medicines List (EML).

Data Analysis: All collected data were tabulated using Microsoft Excel and analyzed using SPSS version 27.0. Descriptive statistics were used to summarize the data. Categorical variables were expressed as frequencies and percentages. Continuous variables (e.g., age) were summarized as mean \pm standard deviation (SD). The primary outcome of interest was the pattern of drug

utilization in the management of osteoarthritis. Comparisons of prescribing patterns were also made across age groups and gender where applicable. A p-value of < 0.05 was considered statistically significant.

Result

Table 1 presents the demographic distribution of patients based on age and gender. The age-wise categorization reveals that the majority of patients (38%) belonged to the 60–69 years age group, followed by 27% in the 50–59 years group. Patients aged 70 years and above accounted for 22%, while the youngest group, aged 40–49 years, comprised 13% of the total population. In terms of gender distribution, female patients represented a significantly higher proportion, constituting 64% of the sample, whereas male patients accounted for 36%. This data indicates that the patient population was predominantly elderly and female.

Table 1: Demographic Profile of Patients

Variable	Number of Patients	Percentage (%)
Age Group (years)		
40–49	20	13%
50–59	40	27%
60–69	57	38%
≥ 70	33	22%
Gender		
Male	54	36%
Female	96	64%

Table 2 outlines the clinical characteristics of the patients diagnosed with osteoarthritis (OA). A large majority (80%) of the patients were affected at the knee joint, indicating that the knee is the most commonly involved site. Both the hip and other joints were affected in 10% of patients each. Regarding the duration of symptoms, the highest proportion of patients (44%) reported experiencing symptoms for 1–3 years, while 32% had symptoms

persisting for more than 3 years. Only 24% of patients had a relatively recent onset of symptoms, less than one year. In terms of severity, moderate OA was the most common, seen in 48% of patients, followed by severe cases in 32%. Mild OA was observed in 20% of the study population. These findings suggest that most patients presented with moderate knee osteoarthritis of more than one year's duration.

Table 2: Clinical Profile of Patients

Clinical Variable	Number of Patients	Percentage (%)
Site of OA		
Knee	120	80%
Hip	15	10%
Others	15	10%
Duration of Symptoms		
< 1 year	36	24%
1–3 years	66	44%
> 3 years	48	32%
Severity of OA		
Mild	30	20%
Moderate	72	48%
Severe	48	32%

Table 3 highlights the pattern of drug utilization among patients with osteoarthritis. Oral non-steroidal anti-inflammatory drugs (NSAIDs) were the most commonly used medications, prescribed to 82% of patients, indicating their primary role in pain management. Paracetamol was also frequently used, administered to 60% of the patients, likely as a first-line or adjunct analgesic. Calcium and Vitamin D supplements were given to 65% of the patients, reflecting efforts to improve bone health and joint function. Disease-modifying osteoarthritis drugs

(DMOADs) such as diacerein and glucosamine were used in 34% of cases, suggesting a moderate reliance on agents aimed at slowing disease progression. Intra-articular corticosteroid injections were the least used, administered to 15% of the patients, possibly reserved for more severe or refractory cases. Overall, the data indicates a preference for NSAIDs and supportive supplements in the management of OA, with a selective use of intra-articular and disease-modifying therapies.

Table 3: Pattern of Drug Utilization

Drug Class / Agent	Number of Patients	Percentage (%)
NSAIDs (Oral)	123	82%
Paracetamol	90	60%
Intra-articular corticosteroids	23	15%
DMOADs (diacerein, glucosamine)	51	34%
Calcium + Vitamin D supplements	98	65%

Table 4 presents the WHO core drug use indicators, reflecting prescribing practices among the osteoarthritis patients studied. The average number of drugs per prescription was 2.8, indicating a moderate level of polypharmacy, which is common in the management of chronic conditions like osteoarthritis. Generic prescribing was observed in 58% of cases, suggesting room for improvement in promoting cost-effective and rational drug use. The use of antibiotics was minimal, appearing in only 2% of prescriptions, which is appropriate given the non-infectious nature of osteoarthritis. Injectable

medications were prescribed in 15% of cases, likely reflecting intra-articular corticosteroid administration in selected patients. Importantly, 70% of the drugs prescribed were from the Essential Medicines List (EML) of India, indicating a reasonably good adherence to national guidelines, though further improvement toward full alignment with the EML is possible. Overall, the data suggest a generally rational prescribing pattern, with particular attention needed in increasing the use of generics and EML-listed medications.

Table 4: WHO Core Drug Use Indicators

Indicator	Value / Percentage (%)
Average number of drugs per prescription	2.8
Percentage of drugs prescribed by generic name	58%
Percentage of prescriptions with antibiotics	2%
Percentage of prescriptions with injectables	15%
Percentage of drugs prescribed from EML (India)	70%

Discussion

The present study provides an overview of the drug utilization pattern in patients with osteoarthritis attending the Orthopaedic Outpatient Department of VMMC and Safdarjung Hospital, New Delhi. The demographic analysis of the study population revealed a predominance of elderly patients, with the highest proportion (38%) in the 60–69 years age group. This finding is consistent with several earlier studies that have reported an increasing prevalence of osteoarthritis with advancing age due to cumulative joint wear and degenerative changes [12]. Additionally, a female preponderance (64%) was observed, which aligns with the findings of Pal and Bijlsma JW et al. 2011 [12], who documented a higher burden of OA among women, particularly in postmenopausal groups, likely influenced by hormonal and biomechanical factors.

Knee osteoarthritis emerged as the most common site of disease in this study, affecting 80% of patients. This observation is in agreement with the study by Woolf AD, et al. 2003 [13], who reported knee OA as the predominant form of the disease among Indian patients. Similarly, Sharma et al. [17] also found knee OA to be the leading cause of disability among OA cases in tertiary care settings in North India. In terms of symptom duration, the majority of patients (44%) reported a duration of 1–3 years, which reflects a pattern of delayed healthcare-seeking behavior common in chronic musculoskeletal conditions in India.

Regarding drug utilization, NSAIDs were the most commonly prescribed agents (82%) in this study. This finding is consistent with the results reported by Pal CP et al. 2016. [14], who also observed NSAID prescription rates of over 80% in OA

patients in South India. NSAIDs remain the cornerstone of OA pharmacotherapy due to their efficacy in relieving pain and inflammation. However, their prolonged use is associated with gastrointestinal and cardiovascular risks, necessitating cautious prescribing, especially in the elderly [15]. The prescription of paracetamol in 60% of patients reflects its role as a safer alternative or adjunct to NSAIDs for pain control, in line with current recommendations [16].

The use of DMOADs (diacerein, glucosamine) in 34% of patients suggests a growing trend towards incorporating disease-modifying agents in routine practice. Similar utilization patterns were reported by Singh et al. [14], who noted increasing prescription of glucosamine-based products in Indian OA management. However, there remains considerable variability in DMOAD use across different centers, possibly due to mixed evidence regarding their long-term efficacy [17]. The widespread use of calcium and vitamin D supplementation (65%) in the present study aligns with guidelines recommending their use to improve bone health and prevent osteoporosis-related complications in OA patients [18].

Intra-articular corticosteroid injections were administered in 15% of patients, mainly for those with moderate to severe disease. This finding is comparable to the study by Chou et al. [19], which reported corticosteroid use in 12–20% of OA patients in clinical practice. Such interventions are typically reserved for cases with significant joint effusion or inadequate response to oral therapy [19].

Evaluation of WHO core drug use indicators showed an average of 2.8 drugs per prescription, which reflects moderate polypharmacy and is within acceptable limits for chronic disease management. The percentage of drugs prescribed by generic name (58%) indicates partial adherence to rational prescribing norms and highlights an area for improvement. The percentage of drugs prescribed from the Essential Medicines List (70%) was comparable to figures reported in earlier Indian studies on musculoskeletal drug utilization [20].

Overall, the results of this study largely corroborate the findings of previous Indian and international studies on OA management. However, the variability in DMOAD use, suboptimal generic prescribing, and the potential over-reliance on NSAIDs underscore the need for continuous efforts to promote evidence-based and rational prescribing practices in OA care. There is also scope to enhance the adoption of non-pharmacological interventions, which were not captured in this study but form an integral part of comprehensive OA management.

Conclusion

The present study provides valuable insights into the current drug utilization pattern in the management of osteoarthritis at a tertiary care teaching hospital in New Delhi. A higher prevalence of OA was observed among elderly patients, particularly females, with knee OA being the most commonly affected joint. NSAIDs (82%) remained the primary pharmacological agents prescribed for pain relief, followed by paracetamol (60%) and intra-articular corticosteroids (15%) for selected cases. The use of DMOADs (34%) and calcium-vitamin D supplementation (65%) reflects growing awareness towards comprehensive OA management. Although the percentage of drugs prescribed from the Essential Medicines List was satisfactory (70%), the study highlights scope for improvement in rational prescribing, particularly in promoting generic drug use and optimizing NSAID utilization to minimize adverse effects. Regular prescription audits, continuous medical education, and adherence to standard treatment guidelines can further enhance the quality of OA management in such clinical settings. Future studies with larger sample sizes and inclusion of non-pharmacological interventions are recommended to build a more holistic understanding of OA care practices.

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