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Original Article

Drug Use Evaluation of Osteoarthritis

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ABSTRACT

Osteoarthritis (OA) is a prevalent degenerative joint disease characterized by pain, stiffness, and functional impairment, leading to significant morbidity and healthcare burden. The management of OA often involves pharmacological interventions aimed at relieving symptoms and improving quality of life. However, the utilization patterns of drugs in OA management and their associated Adverse Drug Reactions (ADRs) remain areas of ongoing research and clinical interest. In this prospective study, we aimed to explore the drug utilization patterns and identify potential adverse drug reactions among patients undergoing treatment for osteoarthritis. A diverse cohort of participants diagnosed with osteoarthritis was recruited and followed longitudinally over a specified duration. Baseline assessments captured demographic characteristics, disease severity, and previous treatment history. Participants were monitored for drug prescriptions or recommendations, including Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), analgesics, Disease-Modifying Osteoarthritis Drugs (DMOADs), corticosteroids, physical therapy, and alternative therapies. Regular monitoring was conducted to identify and assess adverse drug reactions, utilizing patient self-reporting, clinician observation, and medical records review. Data analysis focused on identifying trends in drug utilization, evaluating the frequency and severity of adverse reactions, and identifying potential risk factors associated with ADRs. The findings of this study contribute to the understanding of real-world drug utilization patterns in the management of osteoarthritis and provide insights into the safety profiles of commonly prescribed medications. By identifying potential adverse drug reactions and risk factors, this research aims to inform clinical decision-making and improve patient care and treatment outcomes in osteoarthritis management.

Keywords: Osteoarthritis, Drug utilization patterns, Adverse drug reactions, Pharmacovigilance, Management, Prospective study, Orthopedic care, Treatment outcomes, Pain management, Clinical practice

INTRODUCTION

Osteoarthritis (OA) stands as one of the most prevalent musculoskeletal disorders globally, characterized by joint pain, stiffness, and functional impairment. As a chronic degenerative condition, OA poses significant challenges in its management, often necessitating pharmacological interventions to alleviate symptoms and improve patients' quality of life. However, the optimal selection and utilization of drugs for OA management remain areas of ongoing research and clinical interest. Treatment guidelines for osteoporosis play a crucial role in guiding healthcare providers to effectively manage this condition and prevent associated complications such as fractures. By comprehensively understanding the risk factors and potential complications linked with osteoporotic fractures, healthcare professionals can tailor drug therapy to meet the specific needs of each patient. This personalized approach helps in reducing the likelihood of inappropriate drug utilization, thereby optimizing treatment outcomes. Healthcare providers should prescribe medications based on evidence-based guidelines such as those provided by organizations like the National Osteoporosis Foundation or the American College of Rheumatology. These guidelines consider factors such as age, gender, fracture risk, and comorbidities when recommending specific medications such as bisphosphonates, Selective Estrogen Receptor Modulators (SERMs), denosumab, or teriparatide. Regular monitoring of medication efficacy and side effects is also essential to adjust treatment plans as needed. These guidelines typically encompass recommendations for lifestyle modifications, dietary interventions, and pharmacological therapies. Lifestyle modifications may include regular weight-bearing exercises, adequate intake of calcium and vitamin D, avoidance of tobacco and excessive

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alcohol consumption, and fall prevention strategies. Pharmacological therapies often involve the use of bisphosphonates, Selective Estrogen Receptor Modulators (SERMs), denosumab, teriparatide, and calcitonin, among others. By adhering to evidence-based treatment guidelines, healthcare providers can make informed decisions regarding the selection, initiation, and monitoring of osteoporosis medications. This not only helps in reducing the risk of fractures but also contributes to the overall management of osteoporosis as a significant global health concern. Through continuous updates and revisions based on emerging research and clinical evidence, treatment guidelines ensure that healthcare professionals remain abreast of the latest advancements in osteoporosis management, ultimately leading to improved patient care and outcomes Understanding the patterns of drug utilization and the occurrence of Adverse Drug Reactions (ADRs) is essential for enhancing the effectiveness and safety of OA treatment regimens. While numerous medications, including Non-Steroidal Anti- Inflammatory Drugs (NSAIDs), analgesics, Disease-Modifying Osteoarthritis Drugs (DMOADs), and corticosteroids, are commonly prescribed for OA management, their utilization patterns and associated risks warrant further investigation. In this context, prospective studies play a pivotal role in elucidating real-world practices and outcomes in OA management by prospectively tracking patients over time, such studies offer valuable insights into the dynamic nature of drug utilization patterns and the incidence of ADRs in clinical practice settings. This prospective study aims to explore the drug utilization patterns and identify potential adverse drug reactions among patients undergoing treatment for osteoarthritis. Through systematic data collection and analysis, we seek to delineate the factors influencing drug prescription choices, assess the frequency and severity of adverse reactions, and identify opportunities for optimizing treatment strategies. By shedding light on the complexities of drug utilization and adverse reactions in OA management, this study endeavors to inform evidence- based clinical decision-making, ultimately improving patient care and treatment outcomes in osteoarthritis

Drug Utilization:

DUR is an authorized and structured ongoing review of practitioner prescribing, pharmacist dispensing and patient use of medications. The purpose of DUR is to ensure drugs are used appropriately, safely and effectively to improve patient health status. Predetermined criteria for appropriate drug therapy are compared against a patient's or a population's records. Non-adherence to criteria results in drug therapy changes. In addition, continual improvement in the appropriate, safe and effective use of drugs has the potential to lower the overall cost of care.12,13,14 DUR allows the pharmacist to document and evaluate the benefit of pharmacy intervention in improving therapeutic and economic outcomes while demonstrating the overall value of the pharmacist. DUR is typically classified in three different categories: prospective, concurrent and retrospective.

1. Prospective DUR: Prospective review involves evaluating a patient's planned drug therapy before a medication is dispensed. This process allows the pharmacist to identify and resolve problems before the patient has received the medication. Pharmacists routinely perform prospective reviews in their daily practice by assessing a prescription medications dosage and directions while reviewing patient information for possible drug interactions or duplicate therapy. When part of an online claims adjudication process, prospective DUR often relies on computerized algorithms to perform key checks including drug interactions, duplications or contraindications with the patient's disease state or condition.

Issues Commonly Addressed by Prospective DUR:

Clinical abuse/misuse
Drug-disease contraindications (when a prescribed drug should not be used with certain diseases)
Drug dosage modification
Drug-drug interactions (when two or more different drugs interact and alter their intended effects, often causing adverse events)
Drug-patient precautions (due to age, allergies, gender, pregnancy, etc.)
Formulary substitutions (e.g., therapeutic interchange, generic substitution)
Inappropriate duration of drug treatment
Example: Identification of drug-drug interactions are a common outcome of a prospective DUR. For

example, a patient being treated with warfarin to prevent blood clots may be prescribed a new drug by another specialist to treat arthritis. If taken together, the patient could experience internal bleeding. Upon reviewing the patient's prescriptions, the pharmacist would note the potential drug interaction and contact the prescriber to alert him/her to the problem.

2. Concurrent DUR: Concurrent review is performed during the course of treatment and involves the ongoing monitoring of drug therapy to foster positive patient outcomes. It presents pharmacists with the opportunity to alert prescribers to potential problems and intervene in areas such as drug-drug interactions, duplicate therapy, over or underutilization and excessive or insufficient dosing. This type of review allows therapy for a patient to be altered if necessary. As electronic prescribing becomes more widely adopted, the concurrent DUR process may be performed by the prescriber at the time of prescription transmission to the pharmacy, allowing interventions before the drug is dispensed. An important component of DUR will require complete and current drug and allergy records for the patient, as well as knowledge of appropriate therapeutic interchanges for individuals. As a safety net, pharmacists will perform a similar role as prescribers on the dispensing side of these transactions.

Issues Commonly Addressed by Concurrent DUR:

Drug-disease interactions
Drug-drug interactions
Drug dosage modifications
Drug-patient precautions (age, gender, pregnancy, etc.)
Over and underutilization
Therapeutic Interchange
Example: Concurrent DUR often occurs in institutional settings, where patients often receive multiple medications. Periodic review of patient records can detect actual or potential drug-drug interactions or duplicate therapy. It can also alert the pharmacist to the need for changes in medications, such as antibiotics, or the need for dosage adjustments based on laboratory test results. The key prescriber(s) must then be alerted to the situation so corrective action can be taken.

3. Retrospective DUR: A retrospective DUR reviews drug therapy after the patient has received the medication. A retrospective review aims to detect patterns in prescribing, dispensing or administering drugs. Based on current patterns of medication use, prospective standards and target interventions can be developed to prevent recurrence of inappropriate medication use or abuse. Outcomes of this review may aid prescribers in improving the care of their patients, either individually or within a certain target population (e.g., patients with diabetes, asthma, or high blood pressure).

Issues Commonly Addressed by Retrospective DUR:

Appropriate generic use
Clinical abuse/misuse
Drug-disease contraindications
Drug-drug interactions
Inappropriate duration of treatment
Incorrect drug dosage
Use of formulary medications whenever appropriate
Over and underutilization
Therapeutic appropriateness and/or duplication
Example: An example of a retrospective DUR may be the identification of a group of patients whose therapy does not meet approved guidelines. For example, a pharmacist may identify a group of patients with asthma, who according to their medical and pharmacy history, should be using orally inhaled steroids. Using this information, the pharmacist can then encourage prescribers to utilize the indicated drugs.
Steps in Conducting a Drug Use Evaluation
Most authorities agree the following five steps are essential when conducting any quality-related DUR program.

1. Identify or Determine Optimal Use. An organization's established criteria are defined to compare optimal use with actual use. The criteria should focus on relevant outcomes within a delineated scope for DUR and identify the relevant drugs to be monitored for optimal use in advance. For example, if the use of a drug class prescribed to treat a patient with diabetes is being evaluated, then standards should be determined to identify all drugs within the drug class and to evaluate each drug's effectiveness, such as a decrease in blood glucose or A1c (glycosylated hemoglobin) levels to within normal limits.

2. Measure Actual Use. This step is where data are gathered to measure the actual use of medications. These data can be obtained from medical and prescription records or electronic claim forms. It may require the organization to build an algorithm to identify all members who fit the criteria.

3. Evaluate. Acceptable thresholds (percent of patients meeting the indicator) should be determined prior to the comparison. This step involves applying the algorithm, identifying members who meet the DUR criteria and the comparison between optimal or appropriate and actual use. During this process, the evaluator determines causes for any discrepancies and whether findings are expected. In this process, patterns or aberrations can be identified and interpreted.

4. Intervene. This is the step where corrective action is implemented. Action should be targeted to areas of concern such as prescribing patterns, medication misadventures, and quality of drug therapy or economic consideration.

5. Evaluate the DUR Program. This step assesses the effectiveness of the DUR program. Efforts should be made to evaluate the outcomes and document reasons for positive and negative results. Implementing appropriate changes to the DUR program and continued observation should be undertaken.

6. Report the DUR Findings. The final step is to report these findings to the appropriate team within the organization (e.g., the pharmacy & therapeutics committee) and/or individual prescribers when appropriate.

Value of DUR Programs in Managed Care

Managed health care systems and pharmacy benefit management companies (PBMs) have the responsibility of managing the medication use of anywhere from a few hundred thousand to millions of patients. DUR programs play a key role in helping these organizations understand, interpret and improve the prescribing, administration and use of medications. This is often accomplished by using DUR programs to provide prescribers with feedback on their performance and prescribing behaviors as compared to pre-set criteria or treatment protocols. DUR information also allows prescribers to compare their approach to treating certain diseases with their peers. The benchmarking generated by these comparisons is useful in stimulating prescribers to change their prescribing habits in an effort to improve care. For example, many health plans use DUR to encourage prescribers to use more generic drugs and to comply with treatment guidelines established by national organizations such as the National Institutes of Health or the American Heart Association by reporting prescriber adherence rates. DUR information also assists managed health care systems and PBMs in designing educational programs that improve rational prescribing, formulary compliance and patient compliance. These educational programs might take the form of face-to-face education of prescribers and patients by clinical pharmacists, telephone calls, letters, newsletters and educational symposia.

Role of the Health Care Practitioners

Prospective DUR: This process places responsibility on the health care practitioner to conduct a review of the drug order when it is presented for filling and proactively resolve potential drug-patient problems. It affords the pharmacist or other health care practitioner the opportunity to interact with patients and members of the health care team to work on a treatment plan for each patient. In the retail and institutional settings, a pharmacist can assess the prescription order at the time of dispensing and, using information from the patient's medical and/or pharmacy record, determine the appropriateness of the drug therapy prescribed. If the pharmacist identifies opportunities for improved patient care, he/she can contact the prescriber to discuss treatment alternatives.

Concurrent DUR: The pharmacist and other health care practitioners have the responsibility in the concurrent DUR process to assess the ongoing therapy of the patient and, when necessary, intervene to help modify the patient's treatment plan. When caring for those patients with multiple diseases, case managers may become actively involved in the management of the patient's condition. Through interaction with the prescriber, a health care practitioner within a managed care organization can better understand the care plan the prescriber would

like to follow. Through patient counseling, health care practitioners can offer education on the proper use of medications and determine if there are specific patient needs.

Retrospective DUR: Due to their expertise in drug therapy management, health care practitioners play a leading role in describing the relationship between drug use and patient outcomes using retrospective DUR. When addressing population-based retrospective DUR issues rather than individual patient care, the managed care pharmacist has a primary role in planning, organizing and implementing DUR activities. Pharmacists can educate health care professionals regarding drug use, participate in decision making within the context of the pharmacy and therapeutics (P&T) committee, and serve as members of DUR and other committees where input concerning drug use and drug policy development is required.

Diagnosis of Osteoarthritis: There is no single test for osteoarthritis. Diagnosing the condition may include the Providing to a doctor a medical history that includes your symptoms, any other medical problems you and your close family members have, and any medications you are taking. Having a physical exam to check your general health, reflexes, and problem joints. Having images taken of your joint using: X-rays, which can show loss of joint space, bone damage, bone remodeling, and bone spurs. Early joint damage does not usually appear on x-rays. Magnetic resonance imaging (MRI), which can show damage to soft tissues in and around the joint. Generally, MRI helps health care providers evaluate a joint that is locking or giving out. Having blood tests to rule out other causes for symptoms. Taking joint fluid samples to look for other causes of joint pain, such as infection

Details of class of nsaids prescibed in osteoarthritis: Diclofenac sodium, Aceclofenac, Indomethacin, Ibuprofen Piroxicam, Paracetamol used in treatment of osteoarthritis and it affects males more than females in the age group of 50-65yrs and the knee joint is the most commonly affected joint. NSAIDS especially Aceclofenac and Diclofenac are the most preferred drugs. NSAIDS were prescribed with gastroprotective agents of which Ranitidine and Pantoprazole was most preferred. Paracetamol and SYSADOA were under prescribed. Combination therapy was prefered over monotherapy The principal aim of drug utilization research is to facilitate the rational use of drugs in populations. Drug prescribing studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines

CONCLUSION

Osteoarthritis (OA) is a prevalent degenerative joint disease characterized by pain, stiffness, and functional impairment, leading to significant morbidity and healthcare burden. The management of OA often involves pharmacological interventions aimed at relieving symptoms and improving quality of life. However, the utilization patterns of drugs in OA management and their associated Adverse Drug Reactions (ADRs) remain areas of ongoing research and clinical interest. In this prospective study, we aimed to explore the drug utilization patterns and identify potential adverse drug reactions among patients undergoing treatment for osteoarthritis The process of DUR is still evolving. Using DUR information, managed care pharmacists can identify prescribing trends in patient populations and initiate corrective action to improve drug therapy for groups of patients as well as individuals. As the variety of health care professionals (e.g., pharmacists, prescribers, nurses, optometrists, naturopaths, chiropractors) involved in the medication use process expands, DUR will require a more multidisciplinary approach to improving patient care. In addition, rapidly improving data systems will soon provide the methodology for marrying medical and pharmacy data with patient outcome data. This will lead to the next logical step, the evolution of DUR into a more comprehensive health care utilization evaluation.

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