How to Cite:
Kumar, M., Dutta, S., Sharma, J., & Lote, V. B. (2022). A study of prescription pattern of drugs used in the treatment of osteoarthritis in tertiary care teaching hospitals. *International Journal of Health Sciences*, *6*(S4), 9400–9411. https://doi.org/10.53730/ijhs.v6nS4.10761

A study of prescription pattern of drugs used in the treatment of osteoarthritis in tertiary care teaching hospitals

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***Abstract*---**Background: Evaluation of drug utilization patterns need to be done consistently to facilitate obligatory modifications in prescription pattern of drug to hike the therapeutic benefit and to lessen the adverse effects. Osteoarthritis (OA) is becoming growingly acknowledged as a leading reason of chronic pain and lower limb disability amid the elderly people . There are a very few studies which assess the pattern of drug utilization in newly diagnosed osteoarthritis. So the aim & objective of this research is to study & analyze the recent trends in pattern of drug prescription in newly diagnosed osteoarthritis patients . Methods : It was Prospective, Observational study , newly diagnosed patients with osteoarthritis were enrolled in the study considering the inclusion and exclusion criteria. Data was recorded in a specially designed proforma . Results: NSAIDs were most common prescribed class of drugs which were used in all prescriptions. Paracetamol was used in 73% prescriptions but always in combination with NSAIDs. Tramadol was used in 6%prescriptions. Corticosteroids were used in 7% of prescriptions. SYSADOAs were used in 13.5% prescriptions. Non-pharmacological measures like physiotherapy is not advised to any patient. Conclusion: The prescription trend observed in the study in noncompliance with European evidence-based recommendations for

the management of knee, hip and hand OA which says that paracetamol should be the oral analgesic of first choice and, oral NSAIDs should be started only if, the patient is unresponsive to paracetamol. SYSADOA were under prescribed, this is also noncompliance of the recommendations.

***Keywords*---**osteoarthritis, NSAID, SYSADOA, EULAR, OARSI.

Introduction

A drug utilization research is considered to be one of the most virtual means to evaluate the prescribing character of physicians .[1]The principal aim of drug utilization study is to promote the rational use of drugs in patients. Drug utilization study in itself does not necessarily give answers, but it donate to rational drug use in multiple ways. It can be utilized to estimate the numbers of patients exposed to a certain drug within a certain spell of time and in a certain area. This deals with all drug users, unconcerned of when they commenced to use the drug, or focus on patients who commenced to use the drug betwixt the selected spell of time. It can be used to estimate whether the drugs are utilised duly or not .This study can be used in the application of quality indicators to patterns of prescription .Evaluation of such drug utilization patterns need to be done consistently to facilitate obligatory modifications in prescription pattern of drug to hike the therapeutic benefit and to lessen the adverse effects. Such sort of study will help to observe , assess and modify the drug prescription behavior of medical practitioners to make medical treatment rational and cost effective. Osteoarthritis is a progressive degenerative disorder of multi-factorial etiology characterized by destruction of articular cartilage, subchondral sclerosis associated with synovial changes.[2] Osteoarthritis (OA) is becoming growingly acknowledged in both developed and developing nations as a leading reason of chronic pain and lower limb disability amid the elderly people due to its predilection for lower extremity joints such as the knee and hip.[3,4] Although age is the strongest soothsayer of the development of Osteoarthritis; obesity, injury and physically demanding professions and activities also increase the risk for OA.[5] The management of Osteoarthritis is mainly palliative focusing on symptomatic relief most commonly targeting pain. Therefore, pain relief portrays a crucial role in the management of Osteoarthritis.[6]The prime objectives in the management of Osteoarthritis are to dwindle symptoms and improve functionality .[7] Management of OA begins with the simple approaches like weight reduction (in obesity), exercise, lifestyle modification.[8] Therapeutic measures comprise non pharmacological (e.g. patient education and physiotherapy), pharmacological (e.g. the use of analgesics, non steroidal anti-inflammatory drugs (NSAIDS), and symptomatic slow-acting drugs for osteoarthritis (SYSADOA) and finally surgical treatments (orthopaedic surgery including joint replacement).[9]Amid the pharmacological treatments, NSAIDS abide the most extensively prescribed drugs for OA, irregardless the fact that they provide only symptomatic relief and don't avert progression of the disease.[10] However their long- term use give rise to gastrointestinal ulceration, vascular adverse events and other complications.[11]NSAIDS have also been used topically to lessen gastrointestinal and other adverse effects.[12]considering the serious adverse

effects associated with long-term use of NSAIDS, paracetamol due to its better gastrointestinal safety profile has been recommended as the inceptive drug of choice for treatment of OA.[13,14] NSAIDS should be started only in patients unresponsive to paracetamol.[15] Also the COX-II inhibitors after their launch became a substitute to conventional NSAIDS in patients revealing risk for upper gastrointestinal bleeding and peptic ulcer.[16]But still, in these circumstances , there is a need for safe and effective alternative treatment .Therefore, drugs such as symptomatic slow acting drugs for OA (SYSADOA) which incorporates glucosamine sulfate, glucosamine hydrochloride, chondroitin sulfate, hyaluronic acid and diacerein are often used since their safety and efficacy in OA has been proven in many clinical trials.[17-20]There are a very few studies which assess the pattern of drug utilization in newly diagnosed osteoarthritis despite the substantially high socio-economic impact of OA in our country. Thus, this prospective study was executed to evaluate the pattern of prescription and frequency of the use of drugs in the treatment of newly diagnosed OA and to provide useful feedback to prescribing clinicians .[21,22]

Aim

Aim of this research is to study the recent trends in pattern of drug prescription in newly diagnosed osteoarthritis patients in orthopedic outpatient department of tertiary care teaching hospitals .

Objective

The objective of the study is to analyze the prescription pattern of drugs prescribed for the treatment of newly diagnosed OA in orthopedic outpatient department of tertiary care teaching hospitals .

Materials and Methods

Study design and Site

It was Prospective, Observational study conducted in Department of Orthopaedics Santosh Medical College Ghaziabad, UP & Department of Orthopaedics G S Medical College Pilkhuwa ,Hapur ,UP in collaboration with the Department of Pharmacology Santosh Medical College Ghaziabad,UP.

Study Duration

The study was conducted over for six months, namely from November 15, 2021, to May 10, 2022.

Study Population

It covers prescriptions of newly diagnosed osteoarthritis patients attending the Orthopedic OPD.

Sample size

200 prescriptions of osteoarthritis patients were used.

Inclusion Criteria

(1) Newly diagnosed Osteoarthritis cases of all Age groups and either gender .
(2) Patients treated for osteoarthritis that is managed conservatively.
(3) Patients who are willing to participate in the study.

Exclusion Criteria

(1) Old cases of osteoarthritis those are gating the treatment or got the treatment before.
(2) Patients who are not willing to participate in the study.
(3) Patients with osteoarthritis with surgical indications.
(4) Patients with past H/O gastrointestinal diseases.
(5) Patients with past H/O renal disease.
(6) Patients with past H/O liver disease.

Study Procedure

This study was conducted after obtaining approval from the Institutional Ethics Committee. Patients diagnosed with osteoarthritis were enrolled in the study considering the inclusion and exclusion criteria. Patients were explained in detail about the study, procedure and about their data confidentiality and a written informed consent was taken from the patients prior to the commencement of the study. Data was recorded in a specially designed proforma which include information regarding the demographic profile of the patients and about the pattern of drugs prescribed. The data collected was analyzed statistically using descriptive statistics in the form of percentages.

Results

Demographic pattern

Two hundred new diagnosis of Osteoarthritis were made in the orthopaedics outpatient department during the six months from which the data was collected. Prescriptions of all 200 newly diagnosed patients of osteoarthritis were analyzed, out of which 115 (57.5%) were females and 85 (42.5%) were males as shown in (figure – 1) , So in this study results unveiled that OA was more common in females then male. The result of the study also revealed that OA was more prevalent in the age group of 51-65 years, as 120 [60%] patients fell under this age group(table- 1) .

Details of Disease distribution

Out of 200 patients 196 (98%) patients were affected with osteoarthritis of the knee alone, either unilateral or bilateral while three (1.5%) patients had osteoarthritis of hip and only one (0.5%) had osteoarthritis of wrist (figure – 2) .

Prescription pattern

NSAIDs were most common prescribed class of drugs which were used in all prescriptions [100%](table-3), out of which 97.5% prescription had oral NSAID while only 2.5% of had topical NSAID. Diclofenic was the most commonly prescribed drug of NSAID class which was used in 89[44.5%] prescriptions, Aceclofenac was the second most commonly prescribed drug of this class which was used in 69 [34.5%] prescriptions(table-5). Selective Cox-2 inhibiters were used only in 17[8.5%] prescriptions in which Etoricoxib was the most common which was utilized in 12 [6%] of the same(table-5). Paracetamol was used in 146 [73%] prescriptions but always in combination with NSAIDs . Tramadol was used in 12 [6%] prescriptions , it was the only Opioid analgesic which was used .Corticosteroids were used in 14 [7%] of prescriptions , from this class only two drugs were used one was Prednisolone which was utilized in 11[5.5%] and another was Deflazacort which was given in 3[1.5%] of prescriptions .

SYSADOAs were used in 27 [13.5%] prescriptions, Diacerein was most commonly prescribed drug of this class which is used in 13 [6.5%] prescriptions while Glucosamine and Chondroitin Sulfate were used always together and in 7[3.5%] prescriptions. Calcium and Vit-D3 were always given together and utilized in 62 [31%] prescriptions .PPIs were used along with all oral non selective COX inhibitors and contained in 178 [89%] prescriptions , Pantoprazole was the most commonly used drug of this class which was used in 98 [49%] prescriptions. Diclofenac+Paracetamol+ Pantoprazole was the most common combination of drug which was used in 74[37%] of prescriptions followed by Paracetamol+Aceclofenac+ Omeprazole in 28[14%] of prescriptions (table-6).
Total 701 drugs were used out of which 696(99.3%) were given through oral route while 5(0.7%) were given through topical route(table-2).

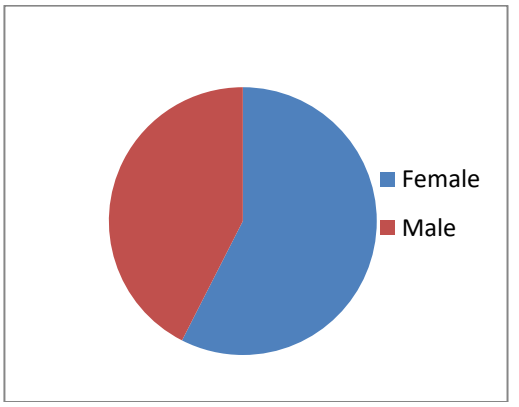

Fig1 : Gender distribution in OA patients.

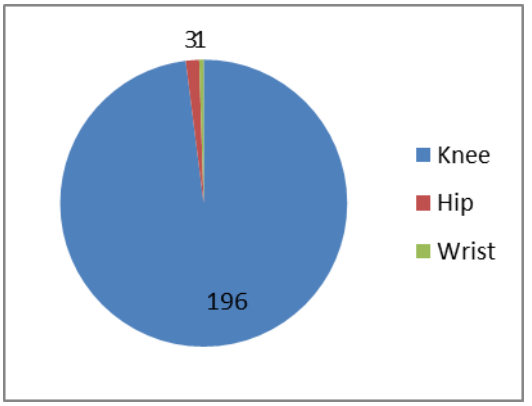

Fig 2: Details of disease distribution of patients in OA

Age distribution(years)	Number of patients (%)
36-50	44(22)
51–65	120(60)
66–80	36(18)
Total	200(100)

Table 1: Details of age distribution in OA patients

Table 2: Distribution based on route of administration in OA patients

Route	Number of Drugs (n=701) (%)
Oral	696(99.3)
Topical	5 (0.7)

Class of drug	Number of prescriptions (%)
NSAIDs	200 (100)
Paracetamol	146 (73)
Corticosteroids	14 (7)
Opioid analgesics	12(6)
SYSADOA	27(13.5)
PPIs	178 (89)

Table 3: Distribution based on class of drug prescribed in OA

Types of therapy	Number of Prescriptions (n=630) (%)
Monotherapy	2(1)
Combination therapy	198(99)

Table -4 Details of types of therapy in OA patients

Drug name	Number of prescriptions (%)
Diclofenac	89(44.5)
Paracetamol	146(73%)
Aceclofenac	69(34.5)
Ibuprofen	10(5)
Tramadol	12 (6)
Nimesulide	8 (4)
Naproxen	2(1)
Piroxicam	5(2.5)
Etoricoxib	12(6)
Valdecoxib	1(0.5)
Rofecoxib	4(2)
Diacerein	13(6.5)
Glucosamine	7(3.5)
Chondroitin Sulfate	7(3.5)
Prednisolone	11(5.5)
Deflazacort	3(1.5)
Omeprazole	58(29)
Pantoprazole	98(49)
Rabeprazole	22(11)
Calcium	62(31)
Vit-D3	62(31)

Table 5: Details of drug prescribed in osteoarthritis patients

Combinations used	Number of patients (%)
Diclofenac+Paracetamol+ Pantoprazole	37
Diclofenac+Paracetamol+ Calcium+ Vit-D3+ Omeprazole	3
Diclofenac+Paracetamol+ Prednisolon+ Pantoprazole	2
Paracetamol+Aceclofenac+ Prednisolon+ Omeprazole	1
Paracetamol+Aceclofenac+ Omeprazole	14
Paracetamol+Aceclofenac+Calcium+	10

Vit-D3+ Pantoprazole	
Aceclofenac + Diacerein+ Omeprazole	3
Paracetamol+Ibuprofen+Diacerein+ Omeprazole	2
Aceclofenac + Glucosamine+ Chondroitin Sulfate + Omeprazole	2
Aceclofenac + Tramadol+ Calcium+ Vit-D3+ Omeprazole	3
Paracetamol+Nimesulide+ Calcium+ Vit-D3+ rabeprazole	4
Ibuprofen+Tramadol+ Calcium+ Vit-D3+ rabeprazole	3
Naproxen+Prednisolon+ Omeprazole	1
Piroxicam+ Prednisolone+rabeprazol	1.5
Piroxicam + Deflazacort+rabeprazol	1
Etoricoxib + Glucosamine+ Chondroitin Sulfate	1.5
Etoricoxib+Calcium+ Vit-D3	3.5
Aceclofenac+ Diacerein+rabeprazol	1.5
Valdecoxib+ Deflazacort	0.5
Rofecoxib+ Calcium+ Vit-D3	2
Diclofenac (topical)+ Calcium+ Vit-D3	2.5
Etoricoxib	1

Table-6 Details of drug combinations used in OA patients

Discussion

In our study demographic data showed that the osteoarthritis was more prevalent in females (57.5%) than males (42.5%). This is in accordance with studies done by ULLAL S D and Gupta R.[26,24] The study revealed that 60 % of osteoarthritis patients were between from 51 to 65 years of age, this is in accordance with the study done by Sam Anbu Sahayam J .[23] In this study we found that 98% of patients have knee OA while wrist and hip joints were involved only in a very little number of patients, this is in accordance with study of ULLAL S D.Such disease distribution pattern is possibly due of squatting and cross-leg sitting practices in India . [26] In the present study oral NSAIDs were used in 97.5% prescriptions which coincides with the study conducted by SHRIKANT B LAHAMATE. [25]Diclofenic was the most commonly prescribed drug of NSAID class , it also correlates with the study conducted by SHRIKANT B LAHAMATE. [25] European evidence-based recommendations for the management of knee, hip and hand OA which is coined by the European League against Rheumatism (EULAR) illustrates that “due to of its safety and efficacy , paracetamol (up to 4g/day) should be the oral analgesic of first choice and, if get successful, it should be the preferred long term oral analgesic”and oral NSAIDs should be started only if, the patient is unresponsive to paracetamol. While , in our study oral NSAIDs were used in 97.5% of prescriptions as first line, although paracetamol were used in 73% prescriptions but it was always given along with NSAID ,so this is noncompliance of the above recommendations . It might be due to lower analgesic efficacy of paracetamol in compare to NSAIDs in osteoarthritis, as shown in the study of Richard et al. In spite of growing evidence that topical NSAIDs have quite good efficacy in treatment of osteoarthritis it is used in only 2.5% of prescriptions; moreover the good efficacy , it is well known that topical NSAIDs have better safety than their systemic counterparts. Selective Cox-2 inhibiters were used in only 8.5% prescriptions this is due to cardiovascular risks associated with its use. In order to prevent gastrointestinal adverse effects, PPIs were used along with all oral non selective COX inhibitors and Pantoprazole was the most commonly used drug of this class, this is in accordance with the study done by Gupta R . [24]Tramadol was used in 6% prescriptions this is also in accordance with the study of Gupta R. [24] In the present study Oral Corticosteroids were utilized in 7% of prescriptions which is parallel to the study of Sam Anbu Sahayam J and SHRIKANT B LAHAMATE . [23,25]SYSADOAs were used only in 13.5%s prescriptions, this is comparable with a study conducted by Gupta R. [24] Osteoarthritis research society international (OARSI) and European League against Rheumatism (EULAR) recommends the use of SYSADOA,but in our study these drugs were used in very low number of prescriptions this noncompliance with above recommendations is probably due to lack of trust in the clinical effectiveness and cost effectiveness of these drugs as they are much expensive compared to NSAIDs. Calcium and Vit-D3 were utilised in 31% prescriptions , this is parallel to the study of Gupta R. [24]Non-pharmacological measures like physiotherapy , weight reduction in obese individuals, etc have an important role in the management of OA but In our study these are not advised to any patient.

Conclusion

This study concluded that osteoarthritis affects females more often than males and knee is the most commonly affected joint. In the present study NSAID was most commonly prescribed drug while Paracetamol was the second most commonly prescribed drug, but it was never given solely and always used together with NSAIDs . This is noncompliance of European evidence-based recommendations for the management of knee, hip and hand OA which is coined by the European League against Rheumatism (EULAR) which says that paracetamol (up to 4g/day should be the oral analgesic of first choice and, oral NSAIDs should be started only if, the patient is unresponsive to paracetamol. In spite of growing evidence that topical NSAIDs have quite good efficacy in treatment of osteoarthritis it is used in only in very little number of prescriptions which exhibits the lack of trust on these evidences . Despite recommends of OARSI and EULAR SYSADOA were under prescribed , this is noncompliance of the above recommendations .It is probably due to cost effectiveness of these drugs and lack of faith in these drugs . Physiotherapy and other Non-pharmacological measures have an important place in the management of OA but in our study these are not advised to even a single patient.

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