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Research Article

TO STUDY PRESCRIPTION PATTERN IN THE MANAGEMENT OF OSTEOARTHRITIS IN TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: The leading cause of disability is arthritis among adults worldwide. Osteoarthritis (OA) is the most common form of joint disease and the leading cause of pain in elderly people. The aim of the study was to study the prescription pattern in the management of OA.

Methods: A prospective observational study was conducted in a tertiary care hospital for period of 12 months in collaboration with the department of orthopedics. A total of 630 patients enrolled in the present study with fulfilling inclusion and exclusion criteria. Patients' data recorded in case report form and analyzed to study the prescription pattern.

Results: A total of 630 cases were enrolled in this study. Osteoarthritis is more common in female i.e. 55% followed by male i.e. 45% of patients. Old age (39.84%) is most common risk factor followed by obesity (29.68%) in OA patient. Most commonly prescribed drug was diclofenac followed by paracetamol. Nonsteroidal anti-inflammatory drugs were most commonly prescribed class of drug, i.e., 92.19%. In this study, combination therapy most commonly prescribed, i.e., 75.4% followed by monotherapy, i.e., 24.6%. Combination therapy in OA patients two drug therapy, i.e., 88.42% followed by three drug therapy, i.e., 10.53%.

Conclusions: The principal aim of drug utilization research is to facilitate the rational use of drugs. The study shows that OA more common in female patient than male patient. The most common disease distribution site was knee in OA patient. Old age was the most common encounter risk factor in OA patient. Combination therapy was most commonly used than single drug therapy.

Keywords: Prescription pattern, Osteoarthritis, Nonsteroidal anti-inflammatory drugs, combination therapy.

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INTRODUCTION

Drug utilization study enables suitable modifications in prescription of pattern to increase the therapeutic benefit and decrease adverse effects [1].

The term arthritis defined as "joint inflammation," but it is referring to conditions that affect the joints and may also affect muscles and other tissues. The most common form of arthritis is degenerative arthritis or osteoarthritis (OA) which is results from the breakdown of the tissue inside the joints. The other form inflammatory arthritis result from swelling in the joints.

The most common form of joint disease is OA and the leading cause of pain in elderly people. The prevalence of knee OA globally was 3.6%, and approximately 251 million people had knee OA in 2010. OA is widely known as the most frequent musculoskeletal disorder, mainly occurring in the elderly with a radiographic prevalence of nearly 70% in persons over age 65. The incidence of OA is rising; by increasing epidemics of obesity and aging population [2].

OA is a progressive and painful chronic disease that affects knee, hand, and hip joints. Pain symptoms associated with OA result in increased physical and walking disability [3,4]. Symptoms such as pain and inflammation become visible in middle age till the age of 55 years occurs equally in both sexes. Pain associated with OA may be periarticular in origin rather than intracapsular. Disease burden is related to pain occurrence, frequently leading to functional disability ranging from slight limitation of movements to severe impairment of normal daily living activities [5].

The management of arthritis is complex and relies on a combination of pharmacological and non-pharmacological approaches for most of patients. Because of pain in osteoarthritis patients, it leads to irrational use of many medication. This misuse leads to intoxication and occurrence of adverse drug reactions, hospitalization, and increase in treatment cost [6].

In the management of OA to reduce symptoms and functionality or even halt the progression of structural changes and to delay or even avoid the need for prostheses. The management of OA has simple approaches such as weight loss (in obesity), exercise, lifestyle alterations, use of analgesics, and topical agents. Therapeutic measures consist of non-pharmacological (e.g., patient education and physical therapy), pharmacological (e.g., the use of analgesics, nonsteroidal anti-inflammatory drugs [NSAIDs]) and symptomatic slow-acting drugs in OA and ultimately surgical treatments (orthopedic surgery including joint replacement). NSAIDs are also most widely prescribed class of medications worldwide and commonly used over the counter [7,8].

NSAIDs cause serious gastrointestinal ulcer and complications are 4 times higher than non-users and reduce gastrointestinal adverse drug reactions by maximizing local delivery and minimizing systemic toxicity [9].

Drug prescription study was conducted in the outpatient department (OPD) at orthopedic department of tertiary care hospital for evaluating drug prescribed trend and to observe and analyze prescribing pattern of drugs use in OA patient.

METHODS

The present study was conducted in the department of pharmacology in collaboration with department of orthopedics for a period of 1 year at a tertiary care hospital. All newly diagnosed patients of OA receiving

treatment attending the OPD of orthopedics for complains of OA were included in the study. During the period, a total 630 patients of OA were found to be attending orthopedic department OPD. Hence, a of total 630 sample size were selected for study.

A prospective observational study was conducted in a tertiary care hospital for a period February 2017–January 2018 which was reviewed. Data from the patient are recorded in case record form and were analyzed for prescription pattern of drug.

Primary objective

The primary objective of the study was to tudy the current trend of prescribing patterns of the drugs used in the management of OA at study site.

Secondary objective

The secondary objective of the study was to analyze the type of therapy-monotherapy or combination therapy.

Inclusion criteria

The following criteria were included in the study:

- Patients of either sex with age >50 years, diagnosed with OA receiving NSAID along with antiulcer drugs at the orthopedic department of tertiary care hospital.
- Patients who are willing to participate in the study.

Exclusion Criteria

The following criteria were excluded from the study:

- Patients with history of gastrointestinal, renal, and liver disease or any psychiatric illness and with surgical indications for the management of OA are excluded from the study.
- Patients who are not willing to participate in the study.
- Patients who are not ready to give informed consent.

RESULTS

The present study was conducted in the department of orthopedics in which patient from OPD was studied for a period of 12 months, in which 630 patients of diagnosed OA were enrolled. The assessment was done in the age group of >50 year of either sex, newly diagnose OA patients. The present study assesses types of NSAIDS, antiulcer drugs prescription and the type of group of other drugs.

In details of gender distribution of OA, the number of patient of OA gender-wise distribution in male and female was 45.24% and 54.76%, respectively (Table 1).

In details of age distribution in OA, age group of 51–57 years, i.e., 243 number of patients (38.57%), followed by the age group of 58–64 years and 65–71 years of age group with 187 number of patients (29.68%) and 130 number of patients (20.64%), respectively (Table 2).

Table 1: Details of gender distribution in OA patients

Gender distribution	Number of patient (%)
Male	285 (45.24)
Female	345 (54.76)
Total	630 (100)

Table 2: Details of age distribution in OA patients

Age distribution(years)	Number of patients (%)
51–57	243 (38.57)
58–64	187 (29.68)
65–71	130 (20.64)
72–78	64 (10.16)
79–88	6 (0.95)
Total	630 (100)

Disease distribution shows that sites of OA were knee, hip, hand, and spine among which knee joint was high with disease distribution in 382 number of patients, i.e., 51.34%, followed by hip joint involvement in 151 number of patients, i.e., 20.3% (Table 3).

In this study, risk factors in OA patients, old age was the most common risk factor, in 251 number of patients, i.e., 39.84% followed by obesity in 187 number of patients, i.e., 29.68% (Fig. 1).

Details of drug prescribed in OA patients, most common drug prescribed was diclofenac in 465 number of prescriptions, i.e., 73.8% followed by the second most common drug prescribed was paracetamol in 439 number of prescriptions, i.e., 69.68% (Table 4).

In class of drug prescribed, NSAIDs were in 1074 number of prescriptions, i.e., 92.19%, followed by corticosteroid in 37 number of prescriptions, i.e., 3.18% in OA patients, followed by opioid analgesics in 31 number of prescription, i.e., 2.66% (Table 5).

In route of drug administration, oral route was in 1165 number of prescriptions, i.e., 87.46%, followed by injectable route in 106 number of patients, i.e., 7.96%, followed by topical route in 61 number of prescriptions, i.e., 4.58% (Table 6).

In antiulcer agents used in OA patients, most common antiulcer agent prescribed in OA patient was ranitidine in 509 number of patients,

Table 3: Details of disease distribution of patients in OA

Disease distribution	Number of patients (%)
Knee	382 (51.34)
Hip	151 (20.3)
Hand	66 (8.87)
Spine	145 (19.49)
Total	744 (100)

Table 4: Details of drug prescribed in osteoarthritis patients

Drug name	Number of prescriptions (%)
Diclofenac	465 (73.8)
Paracetamol	439 (69.68)
Aceclofenac	30 (4.76)
Ibuprofen	35 (5.55)
Tramadol	27 (4.28)
Nimesulide	22 (3.49)
Naproxen	2 (0.31)
Piroxicam	21 (3.33)
Etoricoxib	12 (1.9)
Valdecoxib	3 (0.47)
Celecoxib	3 (0.47)
Rofecoxib	4 (0.63)
Lornoxicam	14 (2.22)
Etodolac	5 (0.79)
Diacerein	17 (2.69)
Glucosamine	23 (3.65)
Prednisolone	29 (4.6)
Indomethacin	2 (0.31)
Deflazacort	8 (1.26)
Dextropropoxyphene	4 (0.63)

Table 5: Distribution based on class of drug prescribed in OA patients

Class of drug	Number of prescriptions (%)
NSAIDs	1074 (92.19)
Corticosteroids	37 (3.18)
Opioid analgesics	31 (2.66)
Glucosamine	23 (1.97)

i.e., 80.79% followed by omeprazole in 53 number of patients, i.e., 8.53% followed by pantoprazole followed by rabeprazole, sucralfate, and esomeprazole, respectively (Fig. 2).

The concomitant therapy used in OA patients shows calcium lactate in 549 number of prescriptions, i.e., 72.42% followed by multivitamin B-complex in 96 number of prescriptions, i.e., 12.66% followed by cholecalciferol and muscle relaxants (Table 7).

Combination therapy was most commonly used in 475 number of patients i.e. 75.4% followed by monotherapy in 155 number of patinets i.e. 24.6% of Osteoarthritis patients (Table 8).

Combination therapy was used in 475 number of patients, of which 420 number of patients, i.e., 88.42% were prescribed two drug therapy followed by three drug therapy in 50 number of patients, i.e., 10.53% followed by more than three drug therapy were used in only 1.0% of patients (Table 9).

In drug therapy, in OA patient shows that Diclofenac+Paracetamol most common combination used in 290 number of patients, i.e., 69.54%, followed by Paracetamol+Ibuprofen in 28 number of patients, i.e., 6.71% followed by Paracetamol+Aceclofenac in 25 number of patients, i.e., 6% (Table 10).

In details of three drug therapy, most commonly used prescription (i.e., diclofenac+paracetamol+prednisolone) in nine number of patients of OA (Fig. 3).

DISCUSSION

Arthritis is an acute or chronic inflammation of joint which is accompanied by pain, swelling, and stiffness resulting either from infection or injury. Most common symptom is pain which is associated with poor quality of life. NSAIDs are the treatment of choice for OA for alleviating the pain associated with this condition (Table 11) [10].

In the present study (Table 1), number of patient of OA gender-wise distribution in male and female was 45.24% and 54.76%, respectively. It correlates with the study conducted by Anjali *et al*. (2016) where OA was more common in female 91 (55.15%) patients than male patients 74 (44.84%) [11].

This study was conducted in patients of OA of age more than 50 years (Table 2) shows that age-wise distribution of total of 630 patients was with more number of patients in age group of 51–57 years, i.e., 243 number of patients (38.57%), followed by the age group of 58–64 years and 65–71 years of age with 187 number of patients (29.68%) and 130 number of patients (20.64%), respectively. Hence, this present study was more prevalent in age group of 51–57 years of age compared with Anjali *et al*. (2016) and Sahayam *et al*. (2016), which shows OA more prevalent in the age group of 51–65 years of age, i.e., in 74 number of patients (44.84%), of which 165 patients of OA and in 54 number of patients (58.69%) of which 92 patients of OA, respectively [11,12].

In this study, disease distribution (Table 3) shows that sites of OA were knee, hip, hand, and spine among which knee joint was high with disease distribution in 382 number of patients, i.e., 51.34%, followed by hip joint involvement. Our study compared with Jhanwar *et al*. (2012) study which shows that disease distribution most common at knee joint in 811 number of patients, i.e., 82.9% and next common site of disease distribution at hip joint [13].

In the present study (Fig. 1), risk factors in OA patients were old age, obesity, family history, fractures, and others such as gender, ethnic characteristic, sports, and joint deformity. Of which old age was the most common risk factor, in 251 number of patients, i.e., 39.84% followed by obesity, which was correlates with Gurung *et al*. (2016) study which shows that old age was most prevalent risk factors in 67 number of patients, i.e., 58.77% of 114 patients of OA [14].

In this study, details of drug prescribed in OA patients (Table 4), most common drug prescribed was diclofenac in 465 number of prescriptions, i.e., 73.8% followed by the second most common drug prescribed was paracetamol in 439 number of prescriptions, i.e., 69.68%, NSAIDs which were most commonly used than other class of drug. Jhanwar *et al*. (2012) study and Yuganeswaran *et al*. (2018) showed that most common prescribed drugs were diclofenac and paracetamol in OA patients [13,15].

Table 6: Distribution based on route of administration in OA patients

Route	Number of prescriptions (n=1332) (%)
Oral	1165 (87.46)
Injectable	106 (7.96)
Topical	61 (4.58)

Table 7: Details of concomitant therapy in OA patients

Concomitant therapy	Number of prescriptions (%)
Muscle relaxant	50 (6.59)
Cholecalciferol	63 (8.31)
Calcium lactate	549 (72.42)
Multivitamin B-complex	96 (12.66)

Table 8: Details of types of therapy in osteoarthritis patients

Types of therapy	Number of drugs prescribed (n=630) (%)
Monotherapy	155 (24.6)
Combination therapy	475 (75.4)

Table 9: Detail approach of combination therapy in OA patients

Combination therapy	Number of patients (%)
Two drug	420 (88.42)
three drug	50 (10.53)
More than three drug	5 (1.05)
Total	475 (100)

Table 10: Details of two drug therapy in OA patients

Two drug therapy	Number of patients (%)
Diclofenac+Paracetamol	290 (69.54)
Paracetamol+Aceclofenac	25 (6)
Paracetamol+Ibuprofen	28 (6.71)
Paracetamol+Tramadol	16 (3.84)
Paracetamol+Nimesulide	12 (2.88)
Diclofenac+Tramadol	1 (0.24)
Diclofenac+Nimesulide	2 (0.48)
Piroxicam+Paracetamol	5 (1.2)
Naproxen+Prednisolone	1 (0.24)
Piroxicam+Prednisolone	1 (0.24)
Etoricoxib+Paracetamol	2 (0.48)
Paracetamol+Prednisolone	5 (1.2)
Lornoxicam+Diclofenac	1 (0.24)
Diclofenac+Glucosamine	4 (0.96)
Diclofenac+Prednisolone	3 (0.72)
Diclofenac+Deflazacort	4 (0.96)
Piroxicam+Diclofenac	1 (0.24)
Etoricoxib+Diclofenac	1 (0.24)
Valdecoxib+Paracetamol	1 (0.24)
Rofecoxib+Deflazacort	1 (0.24)
Lornoxicam+Paracetamol	6 (1.44)
Etodolac+Paracetamol	3 (0.72)
Paracetamol+Glucosamine	2 (0.48)
Paracetamol+Indomethacin	1 (0.24)
Etodolac+Diclofenac	1 (0.23)
Total	417 (100)

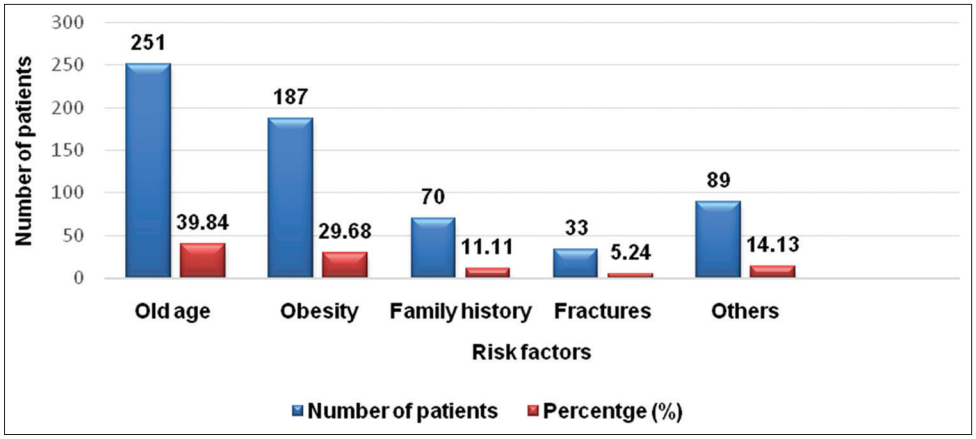

Fig. 1: Details of risk factors in osteoarthritis patients

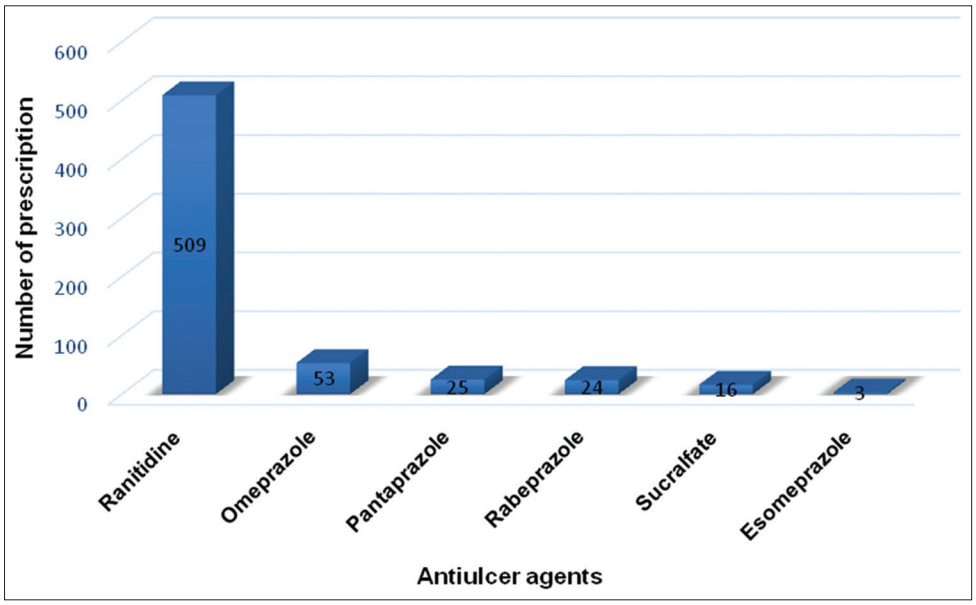

Fig. 2: Distribution of antiulcer agents used in osteoarthritis patients

Table 11: Details of more than three drug therapy in OA patients

More than three drugs	Number of patients (%)
Diclofenac+Paracetamol+Diacerien+Glucosamine	2 (40)
Diclofenac+Paracetamol+Tramadol+Indomethacin	1 (20)
Paracetamol+Ibuprofen+Diacerien+Glucosamine	1 (20)
Lornoxicam+Paracetamol+Diacerien+Glucosamine	1 (20)
Total	5 (100)

In the present study (Table 5), class of drug prescribed was NSAIDs in 1074 number of prescriptions, i.e., 92.19% followed by corticosteroid in 37 number of prescriptions, i.e., 3.18% in OA patients. When our study correlate with Sahayam *et al.* (2016), Purkayastha *et al.* (2016), and Anjali *et al.* (2016) study, where the most common prescribed drug class was NSAIDs in 75.1%, 81.33%, and 70.4%, respectively, in OA patients. Hence, NSAIDs are most common class of drug prescribed in OA patients with above study explanation [10,11,16].

In our study (Table 6), most commonly used route of drug administration was oral route in 1165 number of prescriptions, i.e., 87.46% followed by injectable route in 106 number of patients, i.e., 7.96% followed by topical route in 61 number of prescriptions, i.e., 4.58% compare with Anjali *et al.* (2016) study and Ahmed *et al.* (2012) study showed that route of drug administration was prescribed by an oral route followed by topical route and injectable in OA patients have similar finding with the present study [2,11].

In this study (Fig. 2), antiulcer agents were also prescribed with each prescription of NSAIDs to counteract the gastrointestinal side effects, most common antiulcer agent prescribed in OA patient was ranitidine in 509 number of patients, i.e., 80.79% followed by omeprazole in 53 number of patients, i.e., 8.53% followed by pantoprazole followed by rabeprazole, sucralfate, and esomeprazole which correlate with Gurung *et al.* (2016) study shows that ranitidine was most common gastroprotective drug prescribed in OA patients with 69.66% of patients followed by omeprazole, rabeprazole, and pantoprazole drugs were prescribed shows near about same findings as compared with the present study [14].

In this study, the concomitant therapy (Table 7) used in OA patients shows calcium lactate in 549 number of prescriptions, i.e., 72.42% followed by multivitamin B-complex in 96 number of prescriptions, i.e., 12.66% followed by cholecalciferol and muscle relaxants. From the above explanation, calcium lactate was most commonly used concomitant therapy in our study for improvement of health condition of OA patients. The study conducted by Gupta *et al.* (2018), Patil *et al.* (2016), and Jadhav *et al.* (2011) shows that calcium supplement was

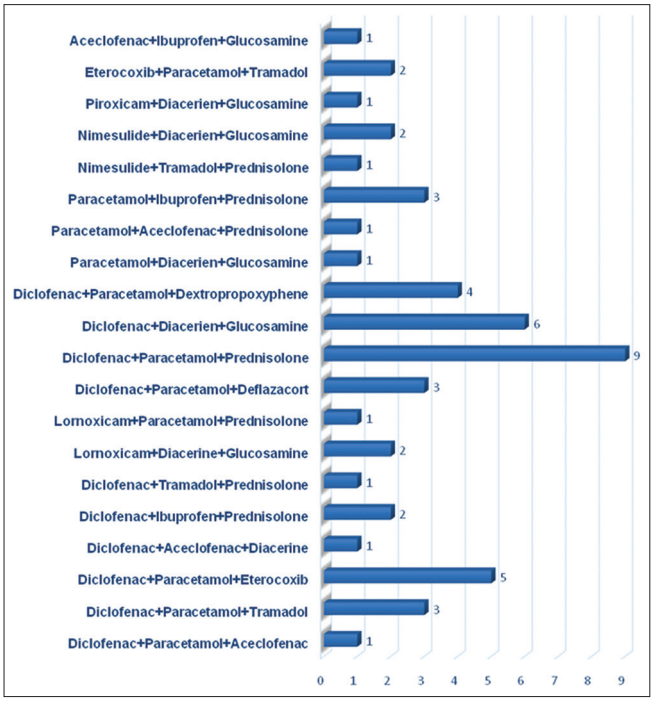

Fig. 3: Details of three drug therapy in osteoarthritis patients

most common concomitant therapy prescribed for OA patients, which have similar finding in accordance with our study [17-19].

In the present study, the details of types of therapy (Table 8) were also shows that combination therapy was most common therapy in 475 number of patients, i.e., 75.4% followed by monotherapy in 155 number of patients, i.e., 24.6% of OA patients, which was compared with study conducted by Gurung *et al*. (2016), Yuganeswaran *et al*. (2018), and Ahmed *et al*. (2012) shows that combination therapy was most commonly used in 72%, 67.02%, and 78.26%, respectively, in OA patients, which was more than monotherapy in accordance with present study and Sahayam *et al*. (2016) study [2,10,14,15].

Our study gives that details of combination therapy (Table 9) were used in 475 number of patients, of which 420 number of patients, i.e., 88.42% were prescribed two drug therapy, followed by three drug therapy in 50 number of patients, i.e., 10.53% followed by more than three drug therapy was used in only 1.0% of patients. From above discussion, two drug therapy most commonly used in more number of patients than other combination therapy. When this present study correlates with Ahmed *et al*. (2012), Gurung *et al*. (2016), and Jhanwar *et al*. (2012) shows that two drug therapy was most commonly used than other combination therapy [11,14].

In the present study, two drug therapy in OA patient (Table 10) shows that Diclofenac+Paracetamol most common combination used in 290 number of patients, i.e., 69.54%, followed by Paracetamol+Ibuprofen in 28 number of patients, i.e., 6.71% followed by Paracetamol+Aceclofenac. The study conducted by Ahmed *et al*. (2012), Gurung *et al*. (2016), and Yuganeswaran *et al*. (2018) study shows that Diclofenac+Paracetamol was the most common prescription used in OA patients which show similar findings in accordance with our study [2,14,15].

CONCLUSIONS

- The principal aim of drug utilization research is to facilitate the rational use of drugs in populations. The rational use of drug implies the prescription of a well-documented drug at an optimal dose. Without knowledge of how drugs is being prescribed and used, it is difficult to initiate a discussion on rational drug use or to suggest measures to improve prescribing habits.
- The WHO suggests that drug utilization studies are needed in every health care setting. Data are useful for preparing essential drug lists and standard treatment protocol.
- In a developing country like India, a National Drug Policy is needed to rationalize the drug use. To achieve this, it is very important to determine drug use pattern and monitor drug use profile over the time and bring it for the awareness among the prescribing doctors.
- The study concludes that the NSAIDs combined with gastroprotective agents were the most appropriate first-line NSAID therapy for many patients. To minimize the occurrence of gastrointestinal toxicity, it is advised to use the National Institute of Clinical Excellence guidance.
- This study shows that OA more common in female patient than male patient.
- Most common disease distribution site was knee in OA patients.
- Old age was the most common risk factor encountered in patients of OA.
- This study shows that in the management of OA, NSAIDs such as diclofenac and paracetamol found to be the most common prescribed drugs.
- Combination therapy prescription most commonly used than single drug therapy prescription. Diclofenac+Paracetamol combination most commonly used.
- In this study, three drug therapy (Diclofenac+Paracetamol +Prednisolone) was prescribed most commonly in OA patients.
- Gastroprotective agents used in every prescription to avoid side effect of NSAIDs in GI system. Most commonly used gastroprotective agent was ranitidine.
- This study gives us idea about current trend of prescription pattern and frequency of drugs used in OA patients.

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CONFLICTS OF INTEREST

None declared.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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