Prescription Pattern of Drugs for Osteoarthritis in a Tertiary Care Hospital

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Abstract: *Osteoarthritis (OA) is a chronic, degenerative disorder of multiple aetiology, characterized by loss of Articular cartilage and Periarticular bone remodelling followed by restricted joint movement. Pain is the most common symptom. Our study aims to assess the prescribing pattern of medication used for the management of Osteoarthritis.100 prescription duplicates were obtained from the patients presenting with OA knee and analyzed for the prescription pattern ; the drug formulation, route, and concomitant medications. The commonly prescribed was Diclofenac. Other classes of drugs used concomitantly were proton pump inhibitors, calcium supplements, steroids and opioids.*
Key Words*:Osteoarthritis (OA),Diclofenac**, Prescription pattern analysis, Tertiary* care hospital.

I. Introduction

Drug utilization research was defined as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the with pattern of prescription. Periodic evaluation of drug utilization makes way for suitable modifications in the prescription of drugs in order to increase the therapeutic benefit and decrease the toxic effect and hence subsequent consequences may be eliminated .The main aim of drug utilization research is to facilitate the rational use of drugs in populations.

It can be used to estimate the numbers of patients exposed to a specific drug within a period of time. This refers to all drug users, regardless of when they started to use the drug, or focus on patients who started to use the drug within the selected period.

Osteoarthritis (OA)[1] is a common slowly progressive disorder affecting primarily the weight –bearing diarthrodial joints of the peripheral and axial skeleton. Osteoarthritis is a disease in which the cartilage that acts as a cushion between bones in joints begins to exhaust, causing swelling and pain in joints which affect negatively. The other synonym of Osteoarthritis is degenerative arthritis or degenerative joint disease.It is characterized by progressive deterioration and loss of articular cartilage resulting in osteophyte formation,pain, limitation of motion, deformity and disability . Based on previous data, an estimated 15.8 million adults [2] , or 12% of those between 25 and 74 years of age, have signs and symptoms of OA. The prevalence of OA is 22% to 39% in India. Pain is the commonest symptom [3] and is associated with bad functional outcomes and poor quality of life. Different kinds of arthritis are, widely spread among the population that make them a clinical problem with social, psychological and economic burden.

The main etiological factors include advanced age, obesity, trauma, heredity, stress and congenital causes. The symptoms of osteoarthritis are mainly due to cartilage destruction and presents with swelling and pain in the joints even at rest. The cartilage destruction is evident on X-ray as joint space narrowing manifesting with severe pain as well as limitations in movement and in some cases there will be stiffness of joints too. Treatment options for OA are NSAIDs, Opioids, Topical analgesics, intra articular injections, Adjunctive treatments include Glucosamine and surgical interventions. NSAIDs also happen to be most widely prescribed often misused by self-medication [4]

II. Materials and Methods

Study procedure

After obtaining Institutional Human Ethics Committee Approval, Study was conducted in the orthopaedic Department of Govt Medical College & ESI Hospital, Coimbatore.

Patients diagnosed with arthritis with or without co-morbidities were enrolled in the study considering the inclusion and exclusion criteria. Informed consent was taken from patient at the time of enrolment in to the study.

Study design
It was a prospective observational study.
Study period
The study was conducted for a period of three months (JAN 2018- Mar 2018)
Sample size:
100 prescription duplicates of osteoarthritis patients were used.

Inclusion Criteria:
* Age above 18 years of age.
* Both males & females.
* Patients treated for osteoarthritis that is managed conservatively.
* Patients who are willing to participate in the study
* Patients treated with oral formulation.

Exclusion Criteria:
(1)   Patients below 18 years of age.
(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.

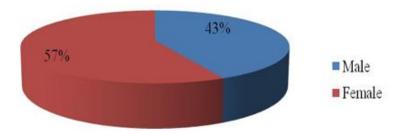## III. Results

Demographic profile
Gender
   OA was more common in male patients, Out of 100 patients, (57%) patients were males and (43%) patients were females as shown in table no.1.

Table no 1 : Shows sex distribution of OA patients

Gender	Percentage (%)
Male	57
Female	43

Fig 1.Explaining Sex Distribution of OA patients

Age
In this study the results revealed that, both OA was more prevalent in the age group of 51-65 years [45(44.84%)] as shown in table 2.

Table no 2 : Shows Age wise distribution of OA patients

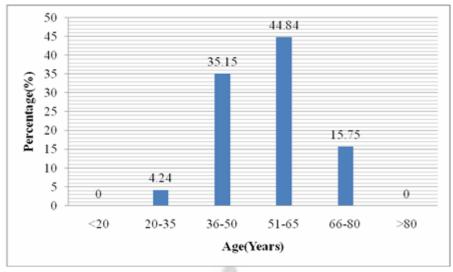| Age (years)	Number of patients (n=100)	Percentage (%)
<20	0	0
20-35	4	4.24
36-50	35	35.15
51-65	45	44.84
66-80	16	15.75
>80	0	0

Fig2. Shows Age wise distribution of OA knee

Type of Drugs Prescribed

The type of drug that was commonly prescribed was Non steroidal Anti inflammatory drug Diclofenac along with paracetamol (25%) followed by Tramadol with paracetamol (16 %). Next Aceclofenac combination therapy with paracetamol was also prescribed for about 14% of population and Treatment with steroids was also prescribed for 3 (3%)

Table No3. Shows Details of Drug prescribed for OA

Drug name	Number of prescriptions (n=100)	Percentage (%)
Diclofenac+ Paracetamol	25	25
Tramadol+Paracetamol	16	16
Aceclofenac+Paracetamol	14	14
Paracetamol+ Ibuprofen	12	12
Diclofenac	8	8
Tramadol	8	8
Paracetamol	4	4
Deflazocort	3	3

Type of Therapy Prescribed

Table No 4. Shows type of therapy advocated for OA

Therapy	Number of Drugs prescribed (n=100)	Percentage (%)
Monotherapy	33	33
Combination therapy	67	67.02

The above table shows that the Combination therapy was preferred one compared to Mono therapy (67% Vs 33%). Since OA is a chronic inflammatory condition, usually the patients respond well with combination therapy.

IV. Discussion

Arthritis is an acute or chronic inflammation of joint, often accompanied by pain, swelling and stiffness and resulting from infection, injury. Pain is the most common symptom and is associated with bad functional outcomes and poor quality of life. Different kinds of arthritis are, widely spread among the population that make them a clinical problem with social, psychological and economic burden. The management of arthritis is complex and relies on a combination of pharmacological and non-pharmacological approaches including drug treatment, for most of the patients; management of arthritis relies mainly on optimization of pharmacotherapy. Unfortunately, there are many reports of extra medication because of pain. This misuse leads to intoxication and occurrence of adverse drug reactions, hospitalizations, and additional treatment and from there to increase in treatment cost. The treatment options have primarily focused on alleviating the pain associated with this condition. Of all the drugs the NSAIDS was the preferred choice.

Non-steroidal anti-inflammatory drugs inhibit cyclo-oxygenase activity and thereby reduce prostaglandin synthesis. Prostaglandin E-2 antagonize the intrarenal effect of vasoconstrictor peptides or catecholamines on the renal vasculature and glomeruli. Blockage of prostaglandin synthesis by the administration of an NSAID removes the prostaglandin-mediated vasodilatory effect and thereby intensifies vasoconstriction which leads to reduction in renal blood flow, leads to increased renal vasculature resistance that can lead to acute renal failure.

Any pre-existing condition leading to reduced vasorenal blood flow, such as congestive heart failure or volume depletion, increases the likelihood of development of renal failure.

Another reversible renal syndrome is interstitial nephritis. This syndrome is characterized by heavy proteinuria and a decline in renal function.NSAIDs are particularly likely to cause sodium and water retention in patients with congestive heart failure, cirrhosis, nephrotic syndrome, and other causes of decreased renal function.

Newman [6] and Ling have reported harmful effects of NSAIDS On osteoarthritic hips. They found a significant relationship between acetabular destruction and NSAID intake. Before elderly patients are put on an NSAIDS a careful risk-factor analysis should be done. Dehydration, diuretic therapy, cirrhosis, and underlying renal disease should all be screened for. Renal function should be assessed before and one month after beginning therapy. Serum potassium levels should be monitored, particularly in the patient on other potassium-sparing drugs. Other drugs that the patient is taking must be considered so that adverse interactions can be avoided. The most significant adverse reactions are the interactions of NSAIDs with the anticoagulant drugs, which result in prolongation of prothrombin time and inhibition of platelet function.NSAIDs, decrease the hypotensive effects of many antihypertensives and diuretics. NSAIDs can also produce a mild elevation of blood pressure in normotensive individuals. Periodic evaluation of drug utilization patterns need to be done to enable suitable Modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects. The study of prescribing patterns seeks to monitor, evaluate and if necessary, suggest modifications in the prescribing behaviour of medical practitioners to make medical care rational and cost effective. Drug prescribing studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines.

The ACR guidelines suggest the use of simple analgesic like paracetamol in the relief of mild-to-moderate joint pain, but our study reveals that there was a limited use of PCT in the management of OA, instead of that Diclofenac was the first preferred drug by the orthopaedicians.

V. Conclusion

The principal aim of drug utilization research is to facilitate the rational use of drugs in populations. For the individual patient, the rational use of a drug implies the prescription of a well documented drug at an optimal dose, together with the correct information, at an affordable price. Without knowledge of how drugs are being prescribed and used, it is difficult to initiate a discussion on rational drug use or to suggest measures to improve prescribing habits. Drug prescribing studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines.

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