

**Drug Prescription Patterns in Osteoarthritis Patients in a Tertiary Care Hospital:****Government General Hospital, Suryapet****I. Sridhar<sup>1</sup>, M.Kavitha<sup>2</sup>, Polagani Padma<sup>3\*</sup>**<sup>1</sup>*Associate Professor, Department of Pharmacology, Government Medical College, Suryapet, Telangana, India*<sup>2</sup>*Associate Professor, Department of Pharmacology, Government Medical College, Nalgonda, Telangana, India*<sup>3\*</sup>*Associate Professor, Department of Pharmacology, Government Medical College, Suryapet, Telangana, India***Received: 03-01-2021 / Revised: 08-02-2021 / Accepted: 25-02-2021****Abstract**

**Background:** Osteoarthritis (OA) is a major cause of chronic pain and lower extremity disability among the elderly due to its predilection for lower extremity joints such as the knee and hip. NSAIDs are often commonly used in the symptomatic relief of osteoarthritis, but Paracetamol is the initial medication of choice. However, there is also a need for effective and reliable alternative therapies that can include both symptomatic relief and the benefits of disease alteration in OA. The goal was to research drug prescribing trends in a tertiary care hospital in India in patients with osteoarthritis. **Methods:** A cross-sectional, prospective study was performed in a tertiary care teaching hospital on newly diagnosed as well as old treated patients with osteoarthritis from the orthopedic outpatient department. After screening for inclusion and exclusion factors, a total of 192 patients were admitted. Data was recorded in a specially developed proforma, which provided details on the patient demographic profile and the prescription medication pattern. **Results:** Of the 192 patients affected by osteoarthritis, women (58.33 percent) were affected more often than men (41.64 percent). The most frequently affected was the OA knee (76.04 percent), unilateral or bilateral, followed by the hip joint, spine, and other joints. In 72.92 percent of patients, NSAIDs were more commonly used than paracetamol, which was used only in 38.54 percent of patients and only in conjunction with NSAIDs and opioids. In 53.64 percent of patients, various other medications were mostly used as adjunct treatments that included gastroprotective agents, calcium in 59.37 percent of patients, vitamin D3 supplements in 52.60 percent of patients, and symptomatic slow-acting OA (SYSADOA) drugs that included diacerein and glucosamine sulfate in 13.02 percent of patients as a mixture. **Conclusion:** Our analysis found that among female patients, osteoarthritis knee was the most common. Paracetamol and SYSADOA are recommended, and the most commonly used OA medications are NSAIDs. To rationalize substance use and increase awareness among prescribing physicians, national drug policies are needed.

**Keywords:** NSAIDs, Osteoarthritis, Paracetamol, SYSADOA.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

**Introduction**

The most prominent type of arthritis is osteoarthritis (OA), affecting millions of individuals worldwide. It happens because, over time, the defensive cartilage that cushions the ends of the bones wears down [1]. OA can greatly impact the quality of life and day-to-day operation of a patient, which in turn reduces productivity. It could also affect healthcare expenses, with the latest estimate that OA will be the fourth largest factor for impairment by 2020 [2]. About 15% of the population is affected by arthritis and OA is the most prevalent cause leading to arthritis [3]. OA is known to be the leading cause of crippling lower extremities in geriatric individuals with a prevalent risk of knee joint OA of up to 40 percent in males and 47 percent in females, the most frequent presence in lower extremity joints, including hip and knee joint. In comparison, the trend is comparatively strong in obese individuals [4]. The cause of elevated morbidity is OA, with a robust correlation with metabolic syndrome, diabetes, and walking anomaly [5]. The latest study showed an increased risk of mortality (particularly cardiovascular abnormalities) in patients with OA [6]. Also, surgery for joint

replacement in OA patients demonstrates a large economic burden. Indeed, according to the UK-based registry, about 90-95% of all hip/knee joint-related operations are due to OA [7]. In the existing literature, there are still ample holes in resolving the patterns of substance use by Chinese OA patients. To cope with OA-linked symptoms, various treatment strategies are available on the market, but there is no specific practice approach at present. With the use of first-line drugs, there is a need for consensus on the various therapeutic modalities to provide better healthcare for OA patients. The diversity in the treatment of OA with different medicinal products has led to new implications for safety and healthcare cost concerns [8]. Several of these medications have been associated with elevated cardiovascular events in the OA population [9]. Several other variables are required, such as the drawbacks of existing medications and the need for expedited recovery from current trials. In this analysis, in a geographically selected population-based group of OA patient pools in Suryapet, Telangana, India, the aim was to establish the utility patterns of different drugs and their combinations for OA. Also, the focus among OA patients was on cardiovascular risk factors. Finally, in this review, the efficacy of each therapeutic agent was explored in the initial year among newly detected OA patients.

\*Correspondence

**Dr. Polagani Padma**

Associate Professor, Department of Pharmacology, Government Medical College, Suryapet, Telangana, India.

E-mail: [padma.polagani70@gmail.com](mailto:padma.polagani70@gmail.com)

### Materials and Methods

After receiving institutional ethical approval, a prospective observational analysis was performed in the Department of Orthopedics of Government General Hospital, Suryapet for Nine Months (April 2019–January 2020). For the present analysis, the calculated sample size was not less than 150 patients. The estimation of the sample size was based on the total number of patients with osteoarthritis who were hospitalized during the study period. After receiving approval from the concerned, the prospective data were collected from the medical records. For the research, patients of either sex, aged over 18 years, admitted to the orthopedic department in the preceding 9 months were included. Patients with details that were missing were disqualified. For the documenting of all the related information, including socio-demographic data, obtained

from the patient care chart and laboratory data sheets, an effective data collection form was created. Data was also obtained in the data collection form, including the name of the drug, dosage form, frequency, and route of administration. In an excel sheet, the information obtained was compiled and interpreted by using descriptive statistics such as frequency and percentage. The Origin Pro 8.5 Statistical Software was used.

### Results

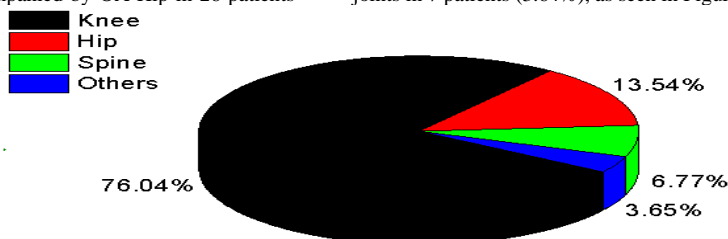
Over the nine months during which the data was compiled, 192 patients diagnosed with osteoarthritis attended the orthopedic outpatient clinic. Prescriptions were examined for all 192 patients, of which 112 (58.33 percent) were females and 80 (41.64 percent) were males. Fifty-three patients were recently diagnosed with OA, and 139 were old cases. Table 1 displays the ethnic profiles of the patients.

**Table 1: Demographic characteristics of patients with osteoarthritis**

Characteristics	n = 192
Female: Male	112:80
Mean age $\pm$ SD	59.23 $\pm$ 4.98
Newly diagnosed (%)	53 (27.60%)
Old cases (%)	139 (72.40%)

Osteoarthritis (OA) knee affected 146 patients (78%), either unilateral or bilateral, accompanied by OA Hip in 26 patients

(13.54%), OA Spine in 13 patients (6.77%), and OA of the other joints in 7 patients (3.64%), as seen in Figure 1.



**Fig 1: Joints involved**

The prevailing health presentations were pain and joint stiffness. All the medications were administered with their brand names, and there was more than one medication in 52 prescriptions (27 percent). Aceclofenac (43.75 percent), Diclofenac (25.52 percent), Ibuprofen (6.77 percent), Nimesulide (6.77 percent), Piroxicam (3.64 percent), and Tramadol (7.30 percent) were the widely prescribed pain relief

medications, followed by Paracetamol, which was used in 74 patients in combination with NSAIDs and Opioids (38.54 percent). In 42 patients, the COX-II antagonist's Etoricoxib and Valdecoxib were both recommended for pain relief (21.87 percent). In 112 patients, topical analgesic creams were used as adjunct therapy (58.33 percent). Details of the medications used in OA are shown in table 2.

**Table 2: Drugs used in osteoarthritis**

Drugs	Monotherapy No. of patients	Combination no. of patients	Total no. of patients	percentage
Acetaminophen/ Paracetamol	2	72	74	38.54 %
Aceclofenac	56	28	84	43.75 %
Diclofenac	18	31	49	25.52 %
Ibuprofen	9	9	18	9.37 %
Nimesulide	12	1	13	6.77 %
Piroxicam	7	-	7	3.64 %
Rofecoxib/etoricoxib/ valdecoxib	42	-	42	21.87 %
Tramadol	9	5	14	7.30 %

Other adjunct therapies included 59.37 percent of patients with calcium and 52.60 percent of patients with vitamin D3 supplementation and 13.02 percent of patients with diacerein and glucosamine sulfate as a combination of SYSADOA, as seen in Table 3.

**Table 3: Adjunct/concomitant therapy**

Drugs	Monotherapy No. of patients	Combination no. of patients	Total no. of patients	percentage
Sysadoa	-	25	25	13.02 %
Antiulcer	105	-	105	54.69 %
Calcium	6	108	114	59.37 %
Vit-D3	8	93	101	52.60 %
Muscle-relaxants	-	32	32	16.66 %

In 103 patients (53.64 percent), gastroprotective agents were used along with oral NSAIDs, of which 58 patients (66.67 percent) preferred Pantoprazole, as seen in Figure 2.

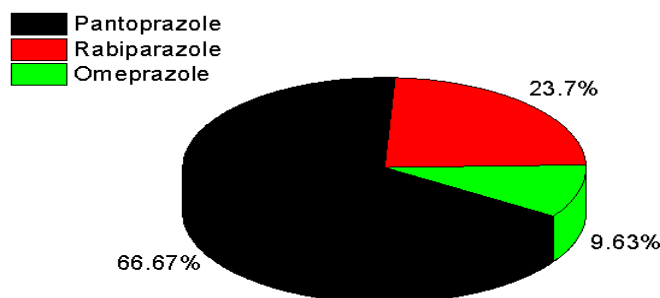


Fig 2: Gastroprotective agents used with NSAIDs

## Discussion

The demographic profile of our sample found that osteoarthritis was more prevalent in women (58.33%) than in men (41.62%) [10, 11]. The disparity may be because females have low oestrogen during their menopausal phase (mean age is 56.2 years), which is not so cartilage-protective [12]. The mean age of osteoarthritis impaired population in our sample was  $59.23 \pm 4.98$  years concerning the age distribution. According to a study conducted by Bishnoi *et al.*, the same age group is often frequently affected by osteoarthritis [11]. The knee joint (76.04 percent) was the most frequently affected site in our analysis among the different sites involved in osteoarthritis, which is in line with other such research, like Jhanwar *et al* [13]. In Indian traditions, this is possibly attributed to improper use of squatting and cross-leg sitting positions. The EULAR and OARS recommendations [14, 15] have favored the use of SYSADOA-glucosamine sulfate, diacerein, especially in early OA. In our research, chondroitin sulfate, diacerein, glucosamine sulfate (SYSADOA), pain relief, and enhancement of physical activity with very low toxicity have been demonstrated [16]. Just 13.02 percent of patients in our sample received diacerein + glucosamine sulfate as an adjunct therapy, despite these medications being very safe and having both symptom-modifying OA effects. Their under-prescription is likely to reflect the lack of confidence in these drugs' therapeutic efficacy and cost-effectiveness since they are expensive relative to NSAIDs. European evidence-based guidelines developed by the European league against rheumatism (EULAR) for the treatment of knee, hip, and hand OA state that "due to its effectiveness and safety, paracetamol (up to 4g/day) is the oral analgesic of the first choice and, if successful, the preferred long-term oral analgesic" because of its gastrointestinal safety. It has been observed that the analgesic effect of paracetamol is close to that of ibuprofen and naproxen. NSAIDs can only be initiated if the patient does not respond to paracetamol. In our study, however, NSAIDs were recommended in 140 (72.92%) of first-line patients and paracetamol was under-prescribed, with just 38.54% of patients consuming paracetamol in combination [17, 18]. This may be because, as demonstrated by Miceli *et al.*, the analgesic potency of paracetamol in osteoarthritis is weaker than that of other NSAIDs, and also because of the symptom-modifying efficacy of paracetamol in OA is suspicious, as observed in some studies [19]. Concurrent use of two or more NSAIDs, which are working under the same mechanism, defies rationality. These medications are the most favored, despite alarming statistics on the adverse effects of oral NSAIDs and their limited disease-modifying effectiveness. The most common NSAID used was Aceclofenac (43.75 percent), followed by Diclofenac (25.52 percent). 58.33% of patients were treated with topical NSAIDs, either individually or in conjunction with systemic NSAIDs. There is growing evidence of comparative effectiveness between topical and oral NSAIDs; besides, topical NSAIDs demonstrate improved gastrointestinal protection than their systemic equivalents. In 21.87 percent of patients, selective COX-2 inhibitors were only recommended because of the potential cardiovascular

dangers. 53.64 percent of gastroprotective agents were used along with non-selective NSAIDs to deter gastrointestinal side effects, of which 66.67 percent of Pantoprazole was the most favored.

## Conclusion

Our research found that osteoarthritis affects women more often than men and the most often affected joint is the knee joint. Paracetamol and SYSADOA were prescribed and the most preferred medication was NSAIDs, especially oral diclofenac, and NSAIDs were prescribed with gastroprotective agents, of which Pantoprazole was the most preferred. A National Drug Policy is needed in a developing country like India to rationalize drug use. To do this, it is very important to establish the trend of substance usage and track the profile of drug use over time and increase awareness among prescribing doctors.

**Ethical approval:** The study was approved by the Institutional Ethics Committee

## References

1. Mobasheri A, Kalamegam G, Musumeci G, Batt ME. Chondrocyte and mesenchymal stem cell-based therapies for cartilage repair in osteoarthritis and related orthopaedic conditions. *Maturitas*. 2014;78(3):188-98.
2. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. *Bulletin of the world health organization*. 2003;81:646-56.
3. Johnson VL, Hunter DJ. The epidemiology of osteoarthritis. *Best practice & research Clinical rheumatology*. 2014;28(1):5-15.
4. Lawrence RC, Felson DT, Helmick CG, Arnold LM, Choi H, Deyo RA, Gabriel S, Hirsch R, Hochberg MC, Hunder GG, Jordan JM. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States: Part II. *Arthritis & Rheumatism*. 2008;58(1):26-35.
5. Yoshimura N, Muraki S, Oka H, Tanaka S, Kawaguchi H, Nakamura K, Akune T. Accumulation of metabolic risk factors such as overweight, hypertension, dyslipidaemia, and impaired glucose tolerance raises the risk of occurrence and progression of knee osteoarthritis: a 3-year follow-up of the ROAD study. *Osteoarthritis and Cartilage*. 2012;20(11):1217-26.
6. Nüesch E, Dieppe P, Reichenbach S, Williams S, Iff S, Jüni P. All cause and disease specific mortality in patients with knee or hip osteoarthritis: population based cohort study. *Bmj*. 2011; 8:342.
7. Porter M, Borroff M, Gregg P, Howard P, MacGregor A, Tucker K. National Joint Registry for England and Wales 9th Annual Report 2012. In: 2009.
8. Jordan KM, Sawyer S, Coakley P, Smith HE, Cooper C, Arden NK. The use of conventional and complementary treatments for knee osteoarthritis in the community. *Rheumatology*. 2004; 43(3): 381-4.
9. Gore M, Sadosky A, Leslie D, Tai KS, Seleznick M. Patterns of therapy switching, augmentation, and discontinuation after

- initiation of treatment with select medications in patients with osteoarthritis. *Clinical therapeutics*. 2011;33(12):1914-31.
10. Amarnath D. Prescribing pattern for osteoarthritis in a tertiary care hospital. *Journal of clinical and diagnostic research*. 2010;4:2421-6.
  11. Bishnoi M, Kumar A, Kulkarni SK. Prescription monitoring of management pattern of osteoarthritis with non-steroidal antiinflammatory drugs at PUHC, Chandigarh in India. *Indian journal of pharmaceutical sciences*. 2006;68(4):20.
  12. Gupta R, Malhotra A, Malhotra P. Study of prescription pattern of drugs used in the treatment of osteoarthritis in a tertiary care teaching hospital: an observational study. *International Journal of Research in Medical Sciences*. 2018;6(3):985.
  13. Jhanwar P. Drug Utilization Study of Osteoarthritis in a Tertiary Care Teaching Hospital of Rajasthan. *Int J Pharma Sci Rev Res*. 2013;14(2):35-7.
  14. Zhang W, Doherty M, Arden N, Bannwarth B, Bijlsma J, Gunther KP, Hauselmann HJ, Herrero-Beaumont G, Jordan K, Kaklamanis P, Leeb B. EULAR evidence based recommendations for the management of hip osteoarthritis: report of a task force of the EULAR Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). *Annals of the rheumatic diseases*. 2005;64(5):669-81.
  15. Zhang W, Moskowitz RW, Nuki G, Abramson S, Altman RD, Arden N, Bierma-Zeinstra S, Brandt KD, Croft P, Doherty M, Dougados M. OARS recommendations for the management of hip and knee osteoarthritis, Part II: OARS evidence-based, expert consensus guidelines. *Osteoarthritis and cartilage*. 2008;16(2):137-62.
  16. Bruyère O, Burlet N, Delmas PD, Rizzoli R, Cooper C, Reginster JY. Evaluation of symptomatic slow-acting drugs in osteoarthritis using the GRADE system. *BMC Musculoskeletal Disorders*. 2008;9(1):1-9.
  17. AR HM, Babu N, Chand S, Nandakumar UP, KC BR. Study on prescription pattern for osteoarthritis in a tertiary care teaching hospital: A retrospective study. *Biomedicine*. 2020;40(3):353-6.
  18. Jadhav MP, Jadhav PM, Mutke AP, Sonawane SD, Patil BD, Naik NB, Sonawale AS. A prospective observational study to assess quality of life and prescription pattern in osteoarthritis patients at tertiary health centre in Mumbai. *Indian journal of medical sciences*. 2011;65(2):1.
  19. Miceli-Richard C, Le Bars M, Schmidely N, Dougados M. Paracetamol in osteoarthritis of the knee. *Annals of the rheumatic diseases*. 2004;63(8):923-30.

**Conflict of Interest: Nil**

**Source of support: Nil**