International Journal of Research in Orthopaedics
Manjula S et al. Int J Res Orthop. 2025 Jan;11(1):118-123
http://www.ijoro.org

Original Research Article

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20243896

Expert perspectives on polmacoxib monotherapy in the management of osteoarthritis in Indian settings

Manjula S.*, Krishna Kumar M.

Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

Received: 03 October 2024
Revised: 08 November 2024
Accepted: 14 November 2024

***Correspondence:**
Dr. Manjula S.,
E-mail: drmanjulas@gmail.com

ABSTRACT

Background: Although there were several clinical studies available, there was a dearth of studies among clinicians in actual practice. So, the present survey-based study aimed to gather expert perspectives on the clinical use of polmacoxib monotherapy for the management of osteoarthritis (OA) in routine Indian settings.
Methods: This cross-sectional study employed a 19-item questionnaire to gather expert opinions on managing OA and covered topics such as prescription practices, clinical observations, preferences and experiences with polmacoxib for routine OA management. Descriptive statistics were used to analyze the gathered data.
Results: The study involved 239 participants, with 45% of respondents noting that 31-40% of OA patients are women. According to 65% of the participants, etoricoxib emerged as the most preferred nonsteroidal anti-inflammatory drug (NSAID) in clinical practice. Moreover, 87% of experts recognized the dual cyclooxygenase-2 (COX-2) and carbonic anhydrase (CA) binding properties of polmacoxib as potentially offering superior safety profiles in cardiovascular (CV), renal aspects and Gastrointestinal (GI) tolerability. Around 35% of respondents observed improvements in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), pain reduction, stiffness alleviation and enhanced physical function with polmacoxib.
Conclusions: The study highlighted a significant preference among Indian clinicians for polmacoxib in managing OA, primarily due to its dual COX-2 and CA binding properties that potentially offer better safety profiles in terms of cardiovascular, renal and GI tolerability. Additionally, the observed improvements in pain, stiffness and physical function with polmacoxib underscore its effectiveness as a monotherapy in routine OA management.

Keywords: Expert perspectives, Osteoarthritis, Pain management, Polmacoxib

INTRODUCTION

Osteoarthritis (OA), a common joint disorder affecting primarily diarthrodial joints, is increasingly impacting society economically as the population ages. It was once viewed as a condition caused mainly by "wear and tear," attributing the breakdown of articular cartilage and resulting inflammation to chronic joint overload and biomechanical issues. However, recent understandings recognize OA as a complex process influenced by inflammatory and metabolic factors.[1-3] In 2020, OA affected an estimated 595 million people globally, marking a 132.2% increase since 1990. Projections for 2050 indicate significant rises in knee, hand, hip and other types of OA cases compared to 2020.[4] The prevalence of OA is on the rise, driven by an aging population and a global obesity epidemic. This trend poses a significant social burden and presents a substantial challenge to public health. The 2015 World Health Organization (WHO) Global Ageing and Health Report underscores OA as a primary cause of disability among adults aged 60 and above. With global populations aging, the health and economic impact of OA is on the rise. The WHO has designated 2021–2030 as the decade of healthy ageing,

prioritizing not only life expectancy but also the quality of life.[5-9] India exhibits a globally higher prevalence of proliferative OA, with knee OA affecting 22-39% of the population.[10] Around 23.46 million individuals in India had OA in 1990, this number increased to 62.35 million in 2019. The age-standardized prevalence of OA increased from 4,895 per 100,000 people in 1990 to 5,313 per 100,000 persons in 2019.[11]

Due to the significant side effects associated with traditional nonsteroidal anti-inflammatory drugs (NSAIDs), particularly gastrointestinal (GI) and cardiovascular risks, their long-term use in OA management is often limited. Therefore, there is a growing demand for newer NSAIDs with improved safety profiles for OA treatment. Polmacoxib, a novel COX-2 inhibitor, acts by inhibiting COX-2 and binding strongly to carbonic anhydrase (CA), which regulates pH levels in the body. This dual mechanism is designed to reduce cardiovascular risks associated with COX-2 inhibition while enhancing efficacy in inflamed joints.[12] In situations where COX-2 and CA are present together, strong binding of Polmacoxib to CA diminishes its COX-2 inhibitory effects. Initial studies have demonstrated varying levels of COX-2 inhibition by Polmacoxib depending on the amount of CA present in the system. Compared to traditional NSAIDs, Polmacoxib shows promise in providing pain relief with fewer GI side effects in OA treatment.[13]

Polmacoxib received its initial approval in South Korea in 2015 for treating colorectal cancer and OA. This first-in-class NSAID uniquely inhibits both COX-2 and CA enzymes. In 2023, Polmacoxib (2 mg) obtained approval from the Drug Controller General of India for treating idiopathic primary OA affecting the hip and knee joints.[12] Although there were several clinical studies available, there was a dearth of studies among clinicians in actual practice. So, the present survey-based study aimed to investigate the prescription practices of Polmacoxib for managing OA in Indian clinical settings.

METHODS

Study settings

A cross-sectional, multiple-response questionnaire-based study was carried out among physicians specialized in treating OA patients in the major Indian cities from June 2023 to December 2023. The study was conducted after getting approval from Bangalore Ethics, an Independent Ethics Committee which was recognized by the Indian Regulatory Authority, Drug Controller General of India.

Study participants

An invitation was sent to leading physicians in managing OA in the month of March 2023 for participation in this Indian survey. About 239 clinicians from major cities of all Indian states representing the geographical distribution shared their willingness to participate and provide necessary data.

Study procedure

The questionnaire booklet titled NEO (NSAIDs and Polmacoxib in Osteoarthritis: Indian Clinicians Perspective) study was sent to the clinicians who were interested in participating in the survey. The NEO study questionnaire consisted of 19 questions aimed at capturing feedback, clinical insights and specialist experiences regarding the use of Polmacoxib in routine clinical practice. Clinicians had the option to skip questions as desired and were instructed to complete the survey independently, without peer consultation. Before participating in the survey, all respondents provided written informed consent.

Statistical analysis

Descriptive statistics were employed for data analysis, using percentages to illustrate the distribution of categorical variables, showing both the frequency and corresponding percentages for each variable. Graphs and pie charts were generated using Microsoft Excel 2013 (version 16.0.13901.20400) to visually depict these variable distributions.

RESULTS

This study included 239 participants. Approximately 47% of the respondents reported seeing 11-20% of weekly cases of OA in clinical practice. About 45% of the clinicians stated that 31-40% of patients presenting with OA in routine practice are women (Table 1). Nearly half of the experts (44.77%) indicated that 21-40% of OA patients are obese. More than half (59%) of the participants reported diagnosing 11-20% of OA patients who are under 45 years of age. Approximately 85% indicated that the knee was the most common site for OA occurrence (Table 2). Around 59% of the clinicians opined that older age was the primary contributing factor for OA in clinical practice (Figure 1).

Half (49.79%) of the participants noted that lack of patient education was associated with non-adherence to OA medication. Around 65% of the respondents reported etoricoxib was the most commonly preferred NSAID in clinical practice (Figure 2). About 60% stated that GI side effects, such as gastric irritation, were drawbacks of traditional NSAIDs. Around 47% of the clinicians reported the risk of GI-related side effects as the drawback of COX-2 selective NSAIDs (Table 3). Approximately 59% of the respondents considered newer drugs considering recent advances and current challenges. Around 44% reported the advantages of Polmacoxib, including not inhibiting COX-2 in CA-rich tissues and inhibiting COX-2 in CA-deficient tissues. Approximately 48% of the clinicians reported that Polmacoxib provides a novel 'tissue-specific' transport mechanism designed to deliver sustained drug levels to inflamed tissues, does not inhibit COX-2 in CA-rich

tissues and has a better tolerability profile. According to 87% of the experts, the unique dual COX-2 and CA binding properties of Polmacoxib offer potentially superior safety profiles in CV and renal aspects, as well as better GI tolerability compared to traditional NSAIDs or COX-2 inhibitors (Figure 3).

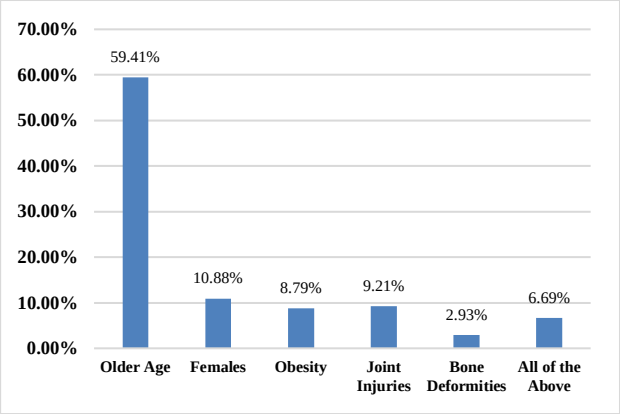

Figure 1: Distribution of response on most common contributing factors for OA in clinical practice.

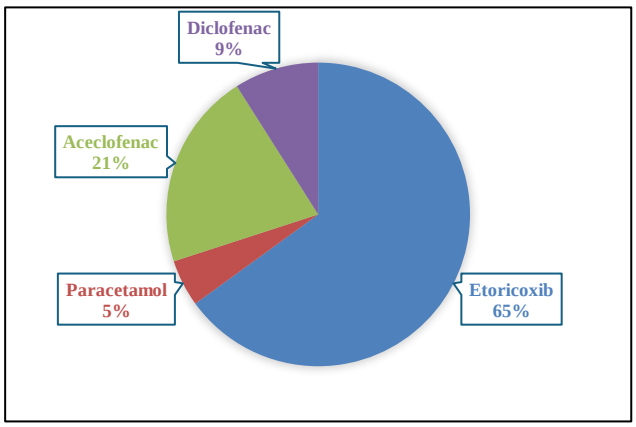

Figure 2: Distribution of response on the most preferred NSAIDs in clinical practice.

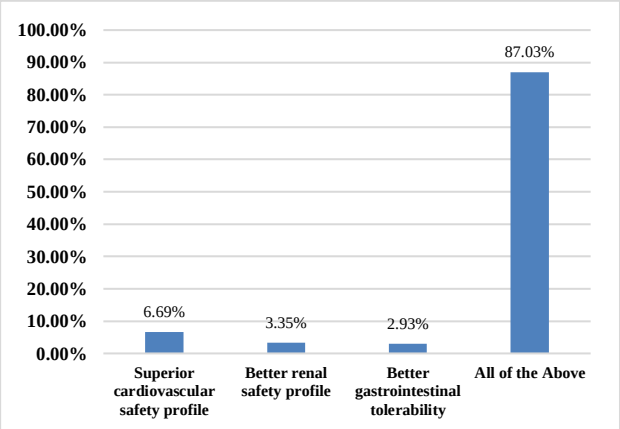

Figure 3: Distribution of response on unique dual COX-2 and CA binding properties of Polmacoxib compared to traditional NSAIDs or COX-2 inhibitors.

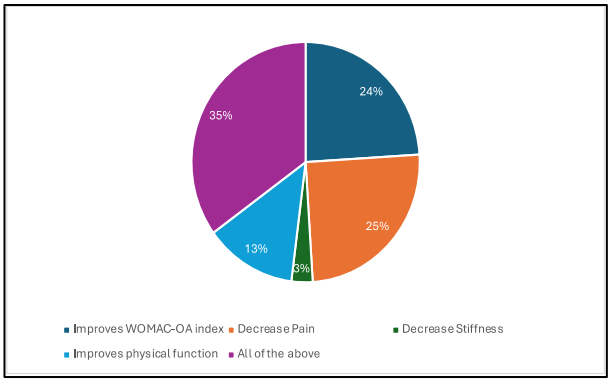

Figure 4: Distribution of response on the use of advantages of using Polmacoxib in patients with OA.

Approximately 35% of the clinicians observed that Polmacoxib improves the WOMAC-OA index, decreases pain and stiffness and improves physical function (Figure 4). About 83% opined that compared to etoricoxib, Polmacoxib was more potent at 2 mg/day, carried a lower risk of GI-related events and was tissue-selective.

Around 82% of the participants stated that compared to celecoxib, Polmacoxib was more potent at 2mg/day, poses a lower risk of CV events and offers improved GI safety (Table 4).

Approximately 59% of the participants indicated that the advantages of Polmacoxib over naproxen, ibuprofen and diclofenac include higher tissue selectivity, improved CV safety and reduced risk of GI events. Around 80% of the respondents reported that unique features of Polmacoxib include quicker relief from OA symptoms, a convenient once-a-day dosing regimen, a recommended low dose of 2 mg/day and significantly improved GI and CV safety compared to other NSAIDs.

Table 1: Distribution of response on the proportion of women among patients presenting with OA in clinical practice.

Women with OA (%)	Response rate (n=239)
<30	19.25%
31-40	45.19%
41-50	26.78%
>50	8.79%

Table 2: Distribution of response on the most affected body part with OA.

Body part	Response rate (n=239)
Hip	7.11%
Knee	85.36%
Hand	3.35%
Shoulder	4.18%

Table 3: Distribution of response on the drawback of COX-2 selective NSAIDs.

Drawbacks	Response rate (n=239)
Risk of BP elevation	10.46%
Risk of GI-related side effects	47.28%
Thrombotic and cardiac adverse events	27.2%
All of the above	15.06%

Table 4: Distribution of response on advantages of polmacoxib over celecoxib.

Advantages	Response rate (n=239)
More potent	1.67%
2mg /day of Polmacoxib versus once or twice/day (200-400 mg/day) of celecoxib	9.21%
Higher risk of CV events with celecoxib	2.93%
Polmacoxib has improved GI safety	3.77%
All of the above	82.43%

DISCUSSION

The survey findings underscored a strong preference for COX-2 selective inhibitors, particularly Polmacoxib, highlighting the importance of adherence to treatment guidelines and the exploration of effective therapies. The results revealed that OA was prevalent in clinical practice, with 47% of respondents encountering 11-20% of weekly cases. The notable prevalence of OA among women (45%) and cases related to obesity (44.77%) suggests the necessity for gender-specific and weight management strategies in OA care.

Srikanth et al, emphasized the value of studying sex differences in OA to gain insights into disease mechanisms. Literature reports indicate that women generally experience a higher prevalence of knee and certain types of hand OA compared to men, particularly after the age of 50 years.[14] Stevens-Lapsley et al, also noted that women have a higher prevalence of OA, especially in the knee.[15]

The predominance of knee OA (85%) and the high diagnosis rate of OA in patients under 45 years (59%) reported in the current survey highlights the necessity for early intervention strategies to manage and possibly delay the progression of OA, especially targeting younger populations.

Primorac et al, noted that OA was a prevalent progressive musculoskeletal condition, primarily impacting weight-bearing joints such as the hips and knees.[16] Tong et al, highlighted OA as a complex, heterogeneous disease affecting various joints including the knee, hip, lumbar facet joint and temporomandibular joint.[9] The majority of the respondents highlighted advanced age as the primary factor contributing to OA in clinical settings. Also, it was noted that oxidative stress associated with aging plays a significant role in the development of OA, leading to increased levels of reactive oxygen species (ROS) within the articular chondrocyte. Age-related oxidative stress leads to elevated levels of ROS within articular chondrocytes.[17] According to the WHO, contributing factors may include a history of joint injury or overuse, advancing age and being overweight.[18]

A significant number of the current survey respondents stated that etoricoxib was the most frequently chosen NSAID for managing OA in clinical practice. In line with this finding, Waraich et al, observed that etoricoxib demonstrated superior safety and clinical effectiveness compared to traditional NSAIDs for managing OA symptoms.[19]

Contreras et al, highlighted the efficacy of etoricoxib for treating both OA and rheumatoid arthritis (RA).[20] Nearly half of the respondents noted that the risk of GI side effects is a concern with COX-2 selective NSAIDs. Sharma et al, reported that COX-2 inhibitors were initially developed to reduce the GI adverse effects associated with traditional NSAIDs.[21]

The majority of them reported that the unique dual COX-2 and CA binding properties of Polmacoxib offer potentially superior safety profiles in CV and renal aspects, as well as better GI tolerability compared to traditional NSAIDs or COX-2 inhibitors. Lee et al, in their study concluded that Polmacoxib 2 mg was well tolerated and demonstrated superior efficacy compared to placebo and non-inferior efficacy compared to celecoxib after 6 weeks of treatment in patients with OA.[13]

The results observed during the additional 18-week trial extension with Polmacoxib 2 mg were consistent with those from the initial 6-week treatment period, suggesting that Polmacoxib may be considered safe for long-term use, despite the study's relatively small scale with a Korean population. Importantly, the study's findings indicated that Polmacoxib has potential as a pain relief medication with reduced GI side effects compared to traditional NSAIDs for OA.[13]

A significant number of survey participants noted that Polmacoxib enhances the WOMAC-OA index, reduces pain and stiffness and improves physical function. Similarly, Lee et al, reported significant improvements in secondary endpoints such as the WOMAC-OA index, WOMAC stiffness score and WOMAC physical function score at week 6 in both the Polmacoxib and celecoxib groups compared to the placebo group. However, there was no statistically significant difference between the Polmacoxib and celecoxib groups for these measures.[13]

Majority of the survey participants stated that compared to celecoxib, Polmacoxib is more potent at 2mg/day, poses a lower risk of CV events and offers improved GI safety. Similarly, Lee et al, noted that Polmacoxib 2 mg was well tolerated and showed efficacy superior to placebo and comparable to celecoxib in patients with OA after 6 weeks of treatment.[13] The superior effectiveness and minimal side effects of Polmacoxib in long-term OA symptom management compared to other NSAIDs have established it as a cornerstone treatment widely supported by clinicians.

Insights from this survey offer valuable direction for refining treatment strategies and enhancing patient care, particularly in the context of the use of Polmacoxib in India. The key strength of the current survey lies in its rigorous methodology, employing a well-structured and validated questionnaire to gather data directly from clinicians.

However, it is significant to ascertain the limitations while interpreting the findings due to potential biases inherent in expert opinions, influenced by diverse perspectives and clinical preferences. Future research should prioritize prospective trials or real-world observational studies to validate these findings and gain a comprehensive understanding of optimal OA management approaches.

CONCLUSION

A significant preference for Polmacoxib among clinicians highlights its superior safety profile and effectiveness in managing OA symptoms compared to other NSAIDs. As OA poses multifaceted challenges, refining the use of Polmacoxib through further investigation promises to enhance its effectiveness and contribute to better outcomes in managing this prevalent musculoskeletal condition across diverse patient demographics in India.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Martel-Pelletier J, Barr AJ, Cicuttini FM, Conaghan PG, Cooper C, Goldring MB, et al. Osteoarthritis. Nat Rev Dis Primers. 2016;13;2:16072.
2. Zhang Y, Jordan JM. Epidemiology of Osteoarthritis. Clin Geriat Med. 2010;1;26(3):355–69.
3. Hawker GA, Stewart L, French MR, Cibere J, Jordan JM, March L, et al. Understanding the pain experience in hip and knee osteoarthritis–an OARSI/OMERACT initiative. Osteoarthr Cart. 2008;1;16(4):415–22.
4. GBD 2021 Osteoarthritis collaborators. Global, regional and national burden of osteoarthritis, 1990-2020 and projections to 2050: a systematic analysis for the global burden of disease study 2021. Lancet Rheumatol. 2023;5(9):508–22.
5. Dieleman JL, Baral R, Birger M, Bui AL, Bulchis A, Chapin A, et al. US Spending on Personal Health Care and Public Health, 1996-2013. JAMA. 2016;27(24):2627–46.
6. Woo J, Lau E, Lau CS, Lee P. Socioeconomic impact of osteoarthritis in Hong Kong: utilization of health and social services and direct and indirect costs. Arthritis Rheum. 2003;15;49(4):526-34.
7. World Report on Ageing and Health. World Health Organization. 2015. Available at: https://www.who.int/publications/i/item/9789241565042
8. Decade of healthy ageing: baseline report. World Health Organization; 2021. Available at: https://www.who.int/publications/i/item/9789240017900
9. Tong L, Yu H, Huang X, Shen J, Xiao G, Chen L, et al. Current understanding of osteoarthritis pathogenesis and relevant new approaches. Bone Res. 2022;20;10(1):60.
10. Acharya RN, Patel HM. Prevalence of the Knee Osteoarthritis Risk Factors Among Young Adult Population - An Observational Study. Int J Health Sci Res. 2023;5;13(10):158–63.
11. Singh A, Das S, Chopra A, Danda D, Paul BJ, March L, et al. Burden of osteoarthritis in India and its states, 1990–2019: findings from the Global Burden of disease study 2019. Osteoarthritis and Cartilage. 2022;1;30(8):1070–8.
12. Easwaran R, Mistry UK, Bhole M, Peethambaran K. Polmacoxib: A Review of the Newer Non-steroidal Anti-inflammatory Drug in Osteoarthritis. Cureus. 2024;16(4):e58446.
13. Lee M, Yoo J, Kim JG, Kyung HS, Bin SI, Kang SB, et al. A Randomized, Multicenter, Phase III Trial to Evaluate the Efficacy and Safety of Polmacoxib Compared with Celecoxib and Placebo for Patients with Osteoarthritis. Clin Orthop Surg. 2017;9(4):439–57.
14. Srikanth VK, Fryer JL, Zhai G, Winzenberg TM, Hosmer D, Jones G. A meta-analysis of sex differences prevalence, incidence and severity of osteoarthritis. Osteoarthritis and Cartilage. 2005;1;13(9):769–81.
15. Stevens-Lapsley JE, Kohrt WM. Osteoarthritis in women: effects of estrogen, obesity and physical activity. Womens Health (Lond). 2010;6(4):601-15.
16. Primorac D, Molnar V, Rod E, Jeleč Ž, Čukelj F, Matišić V, et al. Knee Osteoarthritis: A Review of Pathogenesis and State-Of-The-Art Non-Operative Therapeutic Considerations. Genes (Basel). 2020;26;11(8):854.
17. Loeser RF. The Role of Aging in the Development of Osteoarthritis. Trans Am Clin Climatol Assoc. 2017;128:44–54.
18. Osteoarthritis. World Health Organization. Available at: www.who.int/news-room/fact-sheets. Accessed on 23 Augus 2024.

19. Waraich H, Kumar V, Goel A, Singh J. A comparative study to assess the safety and efficacy of etoricoxib versus aceclofenac in osteoarthritis. Int J Basic & Clin Pharmacol. 2018;24;7:2010.
20. Escudero-Contreras A, Cervantes JVM, Collantes-Estevez E. Update on the clinical pharmacology of etoricoxib, a potent cyclooxygenase-2 inhibitor. Future Rheumatol. 2007;2(6):545–65.
21. Sharma JN, Jawad NM. Adverse effects of COX-2 inhibitors. Scient World J. 2005;5(1):927832.

Cite this article as: Manjula S, Krishna KM. Expert perspectives on polmacoxib monotherapy in the management of osteoarthritis in Indian settings Int J Res Orthop 2025;11:118-23.