

AN EVALUATION STUDY ON OSTEOARTHRITIS IN LONG BONES AND ITS CAUSATIVE FACTORS AND THE ROLE OF CORTICOSTEROIDS IN PAIN MANAGEMENT: AN OBSERVATIONAL STUDY

Dr. Anil Rathi¹, Dr. Chetan Kumar Manekalal Pramar², Dr. Sabir Pasha Md³, Dr. Naresh Kumar Munda⁴

¹ Assistant Professor, Department of Orthopaedics, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.

² Assistant Professor, Department of Anaesthesia, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.

³ Assistant Professor, Department of General Surgery, Faculty of Kanti Devi Medical College and Research Centre, Mathura,

⁴ Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Corresponding Author

Dr. Naresh Kumar Munda

Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

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ABSTRACT

Background: Osteoarthritis (OA) is a degenerative joint disease that significantly affects the long bones, leading to chronic pain and reduced mobility. **Objective:** To evaluate the prevalence, risk factors, and clinical presentation of osteoarthritis in long bones and assess the effectiveness of corticosteroids in its pain management. **Methods:** A cross-sectional observational study was conducted among 36 patients diagnosed with long bone osteoarthritis. Patient demographics, risk factors, and response to corticosteroid treatment were assessed. **Results:** The majority of patients were aged above 50, with a higher prevalence among females. Major risk factors included obesity, prior joint injury, sedentary lifestyle, and age. Corticosteroid administration showed significant short-term pain relief in most patients. **Conclusion:** Osteoarthritis in long bones is multifactorial, predominantly affecting older individuals. Corticosteroids play a beneficial role in short-term pain control, though long-term efficacy requires further research.

KEYWORDS: Osteoarthritis, Pain, corticosteroid.

INTRODUCTION

Osteoarthritis (OA) is one of the most common forms of arthritis, primarily affecting the joints of long bones such as the knees, hips, and shoulders[1]. It is characterized by the breakdown of cartilage, joint space narrowing, osteophyte formation, and varying degrees of inflammation. OA impacts daily activities and is a leading cause of disability worldwide. Understanding the causative factors and role of corticosteroids in managing OA pain can guide clinical interventions and improve quality of life. Osteoarthritis (OA) is a common condition, with a global prevalence of 7.6% of the population in 2020, affecting over 500 million people[2-4]. It's a leading cause of disability, and its prevalence is increasing, especially with an aging population.

prevalence of osteoarthritis: Global Prevalence: In 2020, an estimated 595 million people worldwide had OA, Increasing Cases: The number of people with OA has significantly increased since 1990, with a projected increase of 74.9% for knee OA, 48.6% for hand OA, and 78.6% for hip OA by 2050. Most Affected Joint: The

knee is the most common site for OA, followed by the hip and hand. Sex Differences: Women are more likely to be affected by OA than men[5-7].

Age-Related Increase: The prevalence of OA increases with age, particularly after age 40, with the highest numbers in individuals aged 70 and older. Risk Factors: Key risk factors include age, obesity, joint injury, and specific occupations involving repetitive joint use. Burden: OA significantly contributes to disability, pain, and reduced quality of life, impacting both individuals and healthcare systems.

METHODS

This study was conducted in tertiary hospital. After obtaining institutional ethical committee approval It was Cross-sectional observational study conducted on 36 patients in the department of Orthopaedic, at a tertiary care centre, from March/ 2017 to September /2017.

Total 54 participant were approached to project among them 18 were excluded due to non-fulfilling of eligibility criteria and 36 were included on the basis of fulling of the eligibility criteria

The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical examination.

Study Design: Cross-sectional observational study.

Setting: Orthopedics outpatient department of a tertiary care hospital.

Sample Size: 36 patients diagnosed with osteoarthritis in long bones.

Inclusion Criteria:

- Age $\geq$ 30 years
- Diagnosed OA of knee, hip, or shoulder (clinically and radiologically)
- Provided informed consent

Exclusion Criteria:

- Rheumatoid arthritis or other autoimmune diseases
- Previous joint replacement surgery
- Active infection or malignancy

Data Collection:

- Demographic profile
- Clinical symptoms
- History of corticosteroid use and response
- Radiological grading of OA
- Risk factor profiling

Statistical Analysis:

Descriptive statistics were used to analyze demographic and clinical data. Effectiveness of corticosteroid therapy was assessed using pain score differences (VAS scale).

The data collected was entered in excel spread sheet. The data was analysed by using SPSS statistical software version 20. Statistical analysis in the form of percentages was done. Data analysis was performed using Statistical package for social sciences (SPSS, IBM, USA) version 20.0. Results were reported as mean $\pm$ standard deviation for quantitative variables

Statistical Analysis: SPSS v28, $p < 0.05$ significant

RESULTS

In this study we found that osteoarthritis (OA) is associated with demographic profile of patient. 38.9% patient suffered of osteoarthritis (OA) is belongs to 51 to 60 years age group followed by 27.8% belong to 60 > years ag group.

It means age is important factors for OA, increasing age will prone to OA.

Female (61.1%) were more prone to suffered of osteoarthritis (OA) as compared to male gender. (Table 1)

Demographic Table

Variable	Number (n=36)	Percentage (%)
Age Group (years)		
30–40	4	11.1%
41–50	8	22.2%
51–60	14	38.9%
>60	10	27.8%
Gender		
Male	14	38.9%
Female	22	61.1%
BMI > 25 (Overweight)	21	58.3%
Sedentary Lifestyle	19	52.8%
Joint Injuries (Past)	8	22.2%
Family History of OA	10	27.8%

In this study 66.6 % osteoarthritis (OA) patient were due to Age followed by 61.7% Female Gender (Table 2)

Risk Factors Table 2

Risk Factor	Frequency (n=36)	Percentage (%)
Age > 50 years	24	66.7%
Female Gender	22	61.1%
Obesity (BMI > 25)	21	58.3%
Prior Joint Injury	8	22.2%
Sedentary Lifestyle	19	52.8%
Occupational Stress	7	19.4%
Family History	10	27.8%

Corticosteroid Role in Pain Relief

- Number of Patients Receiving Intra-Articular Corticosteroids: 26
- Improvement in Pain Score (VAS $\geq$ 2 points): 20 patients (76.9%)
- Duration of Relief Observed: 2 to 6 weeks
- Adverse Effects Reported: Minor swelling in 3 cases (11.5%)

Corticosteroids, when used in osteoarthritis (OA) treatment, primarily aim to reduce inflammation and pain. They are often administered via intra-articular injections directly into the affected joint. These injections

can provide short-term pain relief and improve joint function, but their effects are not permanent and may require repeat injections. Here's a more detailed look at the role of corticosteroids in OA: Reducing Inflammation:

Corticosteroids are chemically similar to cortisol, a natural anti-inflammatory hormone, and can suppress the immune system's inflammatory response. Pain Relief: By reducing inflammation, corticosteroids can effectively alleviate pain associated with OA.

DISCUSSION

The study confirms that osteoarthritis of long bones predominantly affects older adults, particularly females, and is closely linked to modifiable factors like obesity and lifestyle. Corticosteroid injections provided substantial short-term pain relief but with limited long-term benefit. The results align with current literature emphasizing the palliative rather than curative role of corticosteroids[8-10].

Osteoarthritis risk factors can be broadly categorized into age, genetics, joint injuries, obesity, and certain metabolic diseases. Additionally, sex assigned at birth (female) and repetitive joint stress also contribute to the likelihood of developing osteoarthritis[11-13].

Elaboration: Age: Osteoarthritis is more common with increasing age. As people age, the cartilage in their joints tends to break down, making them more susceptible to osteoarthritis. Genetics: A family history of osteoarthritis can increase an individual's risk, suggesting a genetic component in the disease. Joint Injuries: Past injuries, such as fractures, sprains, or dislocations, can damage the joint and increase the risk of developing osteoarthritis later in life[14]. Obesity: Being overweight or obese puts extra stress on weight-bearing joints like the knees and hips, accelerating cartilage breakdown and increasing the risk of osteoarthritis. Metabolic Diseases: Certain metabolic diseases, like diabetes, can also contribute to osteoarthritis development[15].

In this study we found that osteoarthritis (OA) is associated with demographic profile of patient. 38.9% patient suffered of osteoarthritis (OA) is belongs to 51 to 60 years age group followed by 27.8% belong to 60 > years age group. It means age is important factors for OA, increasing age will prone to OA.

Female (61.1%) were more prone to suffered of osteoarthritis (OA) as compared to male gender. (Table 1)

People assigned female at birth are more likely to develop osteoarthritis than those assigned male at birth, though the exact reasons are still being researched. Repetitive Joint Stress: Jobs or activities that involve repetitive motions or sustained stress on a joint can increase the risk of osteoarthritis.

In this study 66.6 % osteoarthritis (OA) patient were due to Age followed by 61.7% Female Gender (Table 2)

The higher incidence in females may be related to hormonal changes post-menopause, while obesity contributes to increased mechanical load on joints. Despite good initial pain response, repeated corticosteroid use must be monitored due to potential cartilage damage and systemic effects[16].

Short-Term Symptom Management: Intra-articular corticosteroid injections offer a relatively quick and efficient way to manage OA symptoms, particularly for short-term pain relief. Adjunct to Core Treatment: Corticosteroid injections can be a useful adjunct to other core treatments for OA, such as exercise and physical therapy[17,18]. Not Disease-Modifying: While corticosteroids can improve symptoms, they do not alter the underlying disease progression of OA. Potential Risks and Side Effects:

Long-term use of corticosteroids can have potential side effects, and doctors usually advise against frequent injections. Individualized Approach: The decision to use corticosteroids and the frequency of injections should be made on a case-by-case basis, considering the patient's specific situation and potential risks and benefits

CONCLUSION

Osteoarthritis in long bones is a multifactorial condition largely influenced by age, gender, obesity, and physical inactivity. Corticosteroids offer significant but temporary pain relief, suggesting their role as part of a broader management plan. Preventive strategies addressing modifiable risk factors are essential to delay

disease progression. With the aging of the population throughout the world, the health professions must prepare for the large increase in the number of people with OA requiring health services. Strategies to reduce the burden of hip and knee OA through primary and secondary prevention have become increasingly important

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CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal.

REFERENCES

1. Litwic A, Edwards MH, Dennison EM, Cooper C. Epidemiology and burden of osteoarthritis. *Br Med Bull* 2013;105:185–99.
2. Peat G, Thomas E, Duncan R, Wood L, Hay E, Croft P. Clinical classification criteria for knee osteoarthritis: performance in the general population and primary care. *Ann Rheum Dis* 2006;65:1363–7.
3. Anderson JJ, Felson DT. Factors associated with osteoarthritis of the knee in the first national Health and Nutrition Examination Survey (HANES I). Evidence for an association with overweight, race, and physical demands of work. *Am J Epidemiol* 1988;128:179–89.
4. Palazzo C, Ravaud J-F, Papelard A, Ravaud P, Poiraudau S. The burden of musculoskeletal conditions. *PLoS ONE* 2014;9:e90633.
5. Helmick CG, Felson DT, Lawrence RC, Gabriel S, Hirsch R, Kwoh CK, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part I. *Arthritis Rheum* 2008;58:15–25.
6. Birtwhistle R, Morkem R, Peat G, Williamson T, Green ME, Khan S, et al. Prevalence and management of osteoarthritis in primary care: an epidemiologic cohort study from the Canadian Primary Care Sentinel Surveillance Network. *CMAJ Open* 2015;3:E270–5.
7. Prieto-Alhambra D, Judge A, Javaid MK, Cooper C, Diez-Perez A, Arden NK. Incidence and risk factors for clinically diagnosed knee, hip and hand osteoarthritis: influences of age, gender and osteoarthritis affecting other joints. *Ann Rheum Dis* 2014;73:1659–64.
8. Chopra A. The COPCORD world of musculoskeletal pain and arthritis. *Rheumatology (Oxford)* 2013;52:1925–8.
9. Oliveria SA, Felson DT, Reed JI, Cirillo PA, Walker AM. Incidence of symptomatic hand, hip, and knee osteoarthritis among patients in a health maintenance organization. *Arthritis Rheum* 1995;38:1134–41.
10. De Angelis G, Chen Y. Obesity among women may increase the risk of arthritis: observations from the Canadian Community Health Survey, 2007–2008. *Rheumatol Int* 2013;33:2249–53.
11. Lawrence RC, Felson DT, Helmick CG, Arnold LM, Choi H, Deyo RA, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. *Arthritis Rheum* 2008;58:26–35.
12. Van Saase JL, van Romunde LK, Cats A, Vandenbroucke JP, Valkenburg HA. Epidemiology of osteoarthritis: Zoetermeer survey. Comparison of radiological osteoarthritis in a Dutch population with that in 10 other populations. *Ann Rheum Dis* 1989;48:271–80.
13. Zhang Y, Niu J, Kelly-Hayes M, Chaisson CE, Aliabadi P, Felson DT. Prevalence of symptomatic hand osteoarthritis and its impact on functional status among the elderly: the Framingham Study. *Am J Epidemiol* 2002;156:1021–7.
14. Johnson VL, Hunter DJ. The epidemiology of osteoarthritis. *Best Pract Res Clin Rheumatol* 2014;28:5–15.

15. Felson DT, Lawrence RC, Dieppe PA, Hirsch R, Helmick CG, Jordan JM, et al. Osteoarthritis: new insights. Part 1: the disease and its risk factors. *Ann Intern Med* 2000;133:635–46.
16. Srikanth VK, Fryer JL, Zhai G, Winzenberg TM, Hosmer D, Jones G. A metaanalysis of sex differences prevalence, incidence and severity of osteoarthritis. *Osteoarthritis Cartilage* 2005;13:769–81.
17. de Klerk BM, Schiphof D, Groeneveld FPMJ, Koes BW, van Osch GJVM, van Meurs JBJ, et al. No clear association between female hormonal aspects and osteoarthritis of the hand, hip and knee: a systematic review. *Rheumatology (Oxford)* 2009;48:1160–5.
18. Silverwood V, Blagojevic-Bucknall M, Jinks C, Jordan JL, Protheroe J, Jordan KP. Current evidence on risk factors for knee osteoarthritis in older adults: a systematic review and meta-analysis. *Osteoarthritis Cartilage* 2015;23:507–15.