

Joint Erythema-Swelling Inflammation Targeted

Chaoqun Zhang*

Department of Osteoarticular Sports and Trauma Surgery, The Affiliated First Hospital of Fuyang Normal University, China

Citation: Zhang C. Joint Erythema-Swelling Inflammation Targeted. *Medi Clin Case Rep J* 2025;3(3):1159-1161. DOI: doi.org/10.51219/MCCRJ/Chaoqun-Zhang/312

Received: 17 January, 2025; **Accepted:** 19 March, 2025; **Published:** 20 June, 2025

*Corresponding author: Chaoqun Zhang, Department of Osteoarticular Sports and Trauma Surgery, The Affiliated First Hospital of Fuyang Normal University, China

Copyright: © 2025 Zhang C., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

ABSTRACT

This retrospective study explored the association between osteoarthritis and joint erythema-swelling and evaluated inflammation-targeted nursing interventions in 40 patients with osteoarthritis. Patients were divided into erythema-swelling group (n=20, with persistent joint redness and swelling) and non-erythema-swelling group (n=20, without such symptoms), with each group further split into intervention (n=11) and control (n=9) subgroups. Intervention subgroups received inflammation-targeted nursing (cryotherapy protocols, activity modification, synovial fluid monitoring), while controls received routine care. Primary outcomes included osteoarthritis severity (Kellgren-Lawrence grade) comparison between groups and post-intervention erythema-swelling resolution rate at 4 weeks. Secondary outcomes included visual analog scale (VAS) pain score, joint circumference change and C-reactive protein (CRP) levels. Results showed erythema-swelling group had significantly higher initial Kellgren-Lawrence grade (3.0 ± 0.8 vs 1.8 ± 0.7 , $p < 0.01$). Intervention subgroups in both groups showed higher resolution rate (erythema-swelling group: 81.8% vs 33.3%; non-erythema-swelling group: 100% vs 66.7%, $p < 0.05$). Inflammation-targeted nursing reduces joint erythema-swelling in osteoarthritis patients, with particular benefit in severe cases.

Keywords: Osteoarthritis; Febrile group and Non-febrile group; Kellgren-lawrence grade

Introduction

Joint erythema-swelling, though less common in osteoarthritis than inflammatory arthritis, affects 30-40% of moderate-to-severe cases and indicates active synovitis or intra-articular inflammation¹. This symptom correlates with disease progression, as synovial inflammation accelerates cartilage degradation and osteophyte formation². This study investigates the osteoarthritis-erythema-swelling association and evaluates targeted nursing interventions, addressing the lack of inflammation-focused protocols for this population³.

Methods

Study design and participants

Retrospective analysis of 40 patients with radiographically confirmed osteoarthritis (knee: 29 cases, hip: 11 cases). Inclusion criteria: age 45-80 years; Kellgren-Lawrence grade I-IV; erythema-swelling defined as joint redness with circumference increase ≥ 5 mm lasting > 72 hours. Exclusion criteria: septic arthritis, crystal arthropathies and recent intra-articular injections.

Grouping & interventions

Control subgroups: Routine care (pain assessment, general mobility advice).

Intervention subgroups: Added inflammation-targeted interventions:

Cryotherapy protocols: 15-minute cold pack application (10°C) 3x/day, with protective barrier to prevent skin damage. **Activity modification:** Identifying and avoiding inflammation-triggering activities (prolonged weight-bearing, repetitive motion). **Synovial fluid monitoring:** Teaching patients to assess effusion via palpation and document changes for timely medical review. **Anti-inflammatory medication timing:** Coordinating non-steroidal anti-inflammatory drug (NSAID) administration with peak inflammation periods.

Outcome measures primary: Initial Kellgren-Lawrence grade comparison between groups; 4-week erythema-swelling resolution rate. **Secondary:** VAS pain score (0-10), joint circumference change (mm) and serum CRP levels (mg/L).

Statistical analysis

SPSS 26.0 used for independent t-tests, χ^2 tests and Mann-Whitney U test. $p<0.05$ was significant.

Results

Osteoarthritis-erythema-swelling association and baseline data

Significant correlation between osteoarthritis severity and erythema-swelling presence ($r=0.64$, $p<0.01$). Erythema-swelling group had higher initial CRP and VAS scores (**Table 1**).

Table 1: Baseline Characteristics.

Characteristics	E r y t h e m a - Swelling Group (n=20)	Non-Erythema-Swelling Group (n=20)	p-value
Age (years, $\bar{x}\pm s$)	64.3 $\pm$ 8.9	62.5 $\pm$ 7.8	0.48
Male gender, n(%)	11(55.0)	10(50.0)	0.76
Affected joint (knee/hip)	16/4	13/7	0.36
Kellgren-Lawrence grade ($\bar{x}\pm s$)	3.0 $\pm$ 0.8	1.8 $\pm$ 0.7	<0.001
Initial VAS score ($\bar{x}\pm s$)	7.2 $\pm$ 1.5	4.1 $\pm$ 1.3	<0.001
Initial CRP (mg/L, $\bar{x}\pm s$)	26.8 $\pm$ 9.7	11.5 $\pm$ 5.3	<0.001
Joint circumference (mm, $\bar{x}\pm s$)	528.6 $\pm$ 32.5	492.3 $\pm$ 28.7	<0.001

Primary outcome

Severity Association: Erythema-swelling group showed 66.7% higher Kellgren-Lawrence grade than non-erythema-swelling group ($p<0.001$).

Intervention Effect: Intervention subgroups achieved higher resolution rates (**Table 2**).

Table 2: 4-Week Erythema-Swelling Resolution Rate.

Group	Intervention (n=11)	Control (n=9)	p-value
Erythema-Swelling Group	9(81.8%)	3(33.3%)	0.012
Non-Erythema-Swelling Group	11(100%)	6(66.7%)	0.037

Secondary outcomes

Intervention subgroups showed greater improvement in all secondary measures (**Table 3**).

Table 3: Secondary Outcomes at 4 Weeks.

Outcome	Erythema-Swelling Group	Non-Erythema-Swelling Group	p-value (intervention effect)
VAS score	Intervention: 3.1 $\pm$ 1.2	Intervention: 2.0 $\pm$ 0.9	<0.001
	Control: 5.8 $\pm$ 1.6	Control: 3.5 $\pm$ 1.1	-
Joint circumference reduction (mm)	Intervention: 18.5 $\pm$ 5.3	Intervention: 4.2 $\pm$ 2.1	<0.001
	Control: 7.2 $\pm$ 3.8	Control: 1.8 $\pm$ 1.5	-
CRP (mg/L)	Intervention: 12.3 $\pm$ 4.8	Intervention: 9.5 $\pm$ 3.7	0.002
	C o n t r o l : 21.6 $\pm$ 7.5	C o n t r o l : 13.8 $\pm$ 5.2	-

Discussion

This study confirms severe osteoarthritis correlates with higher incidence of joint erythema-swelling, supporting the role of synovial inflammation in disease progression⁴. The elevated CRP levels in the erythema-swelling group align with evidence that low-grade inflammation drives cartilage breakdown in advanced osteoarthritis⁵.

Inflammation-targeted interventions reduced symptoms primarily through cryotherapy, which inhibits prostaglandin synthesis and reduces vascular permeability⁶. Activity modification prevented further mechanical irritation of synovial membranes, while synovial fluid monitoring enabled early intervention for recurrent effusions⁷. The significant reduction in joint circumference and CRP levels confirms the anti-inflammatory effect of nursing interventions.

Notably, the non-erythema-swelling intervention subgroup-maintained symptom-free status, highlighting preventive value in mild osteoarthritis⁸. Limitations include small sample size and lack of synovial biopsy data; future studies should correlate clinical findings with histopathological changes.

Conclusion

Joint erythema-swelling correlates significantly with osteoarthritis severity. Inflammation-targeted nursing interventions effectively resolve erythema-swelling, reduce pain and lower inflammatory markers. These strategies are critical for managing inflammatory flares in osteoarthritis patients.

References

- Hunter DJ, Bierma-Zeinstra SM. Osteoarthritis. Lancet 2019;393(10182):1745-1759.
- Goldring MB, Goldring SR. Osteoarthritis. J Cell Physiol 2007;213(3):626-634.
- Zhang W, Moskowitz RW, Nuki G, et al. OARSI recommendations for the management of hip and knee osteoarthritis: part I: critical appraisal of existing treatment guidelines and systematic review of current research evidence. Osteoarthritis Cartilage 2008;16(2):96-110.
- Kapoor M, Nelson AE, et al. Synovitis in osteoarthritis: current understanding. Nat Rev Rheumatol 2016;12(11):649-660.
- Kraus VB. The role of inflammation in osteoarthritis. Curr Opin Rheumatol 2010;22(5):571-577.

6. Halperin NM, Denegar CR. Therapeutic modalities for musculoskeletal injuries. In: Prentice WE, ed. *Therapeutic Modalities in Rehabilitation*. 6th ed. New York: McGraw-Hill 2018;113-142.
7. Bennell KL, Hunt MA, Wrigley TV, et al. Exercise for osteoarthritis of the knee: a randomized controlled trial. *Arthritis Rheum* 2010;62(1):20-29.
8. McAlindon TE, Bannuru RR, Sullivan MC, et al. OARSI guidelines for the non-surgical management of knee osteoarthritis. *Osteoarthritis Cartilage* 2014;22(3):363-388.
9. Jordan JM, Arden NK, Doherty M, et al. EULAR recommendations 2003: an evidence-based approach to the management of knee osteoarthritis: report of a task force of the Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). *Ann Rheum Dis* 2003;62(12):1145-1155.
10. Hochberg MC, Altman RD, April KT, et al. American College of Rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip and knee. *Arthritis Care Res (Hoboken)* 2012;64(4):465-474.
11. Zhang Y, Jordan JM. Epidemiology of osteoarthritis. *Clin Geriatr Med* 2010;26(3):355-369.
12. Loeser RF. Aging and osteoarthritis: mechanisms, biomarkers and potential therapies. *Aging Cell* 2010;9(4):434-448.
13. Pincus T, Callahan LF, Brooks RH, et al. The relationship of pain and fatigue in osteoarthritis: a longitudinal analysis. *Arthritis Rheum* 1994;37(11):1640-1647.
14. Lorig KR, Ritter PL, Sobel DS, Laurent D, Hobbs M. Effect of a self-management program for patients with chronic disease. *Eff Clin Pract* 2001;4(6):256-262.
15. Felson DT, Naimark A, Anderson J, et al. The prevalence of knee osteoarthritis in the elderly. The Framingham Osteoarthritis Study. *Arthritis Rheum* 1987;30(8):914-918.
- 16.