ISSN: 2584-0355
DOI: doi.org/10.51219/MCCRJ/Chaoqun-Zhang/319

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Vol: 3 & Iss: 3

Research Article

Correlation Between Osteoarthrosis and Post-Activity Symptom Relief

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Citation: Zhang C. Correlation Between Osteoarthrosis and Post-Activity Symptom Relief. *Medi Clin Case Rep J* 2025;3(3):1180-1182. DOI: doi.org/10.51219/MCCRJ/Chaoqun-Zhang/319

Received: 07 February, 2025; **Accepted:** 09 April, 2025; **Published:** 11 July, 2025

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ABSTRACT

This retrospective study explored the correlation between osteoarthrosis and post-activity symptom relief and evaluated activity-optimizing nursing interventions in 60 patients with osteoarthrosis. Patients were divided into responsive group (n=35, ≥50% symptom reduction post-activity) and non-responsive group (n=25, <50% reduction), with each group split into intervention (responsive: n=18; non-responsive: n=13) and control (responsive: n=17; non-responsive: n=12) subgroups. Intervention subgroups received activity-optimizing nursing (individualized activity prescription, timing adjustment, intensity modulation), while controls received routine care. Primary outcomes included correlation between osteoarthrosis severity (Kellgren-Lawrence grade) and relief duration and post-intervention relief maintenance rate at 12 weeks. Secondary outcomes included pain visual analog scale (VAS) change, joint stiffness duration and activity adherence rate. Results showed significant negative correlation between Kellgren-Lawrence grade and relief duration ($r=-0.68$, $p<0.01$). Intervention subgroups had higher maintenance rate (responsive: 83.3% vs 47.1%; non-responsive: 61.5% vs 25.0%, $p<0.05$). Activity-optimizing nursing enhances post-activity relief in osteoarthrosis patients, particularly those with mild-to-moderate disease.

Keywords: Osteoarthrosis; post-activity symptom relief; Kellgren-lawrence grade; Mild-to-moderate disease

Introduction

Post-activity symptom relief is a distinctive feature in 40-50% of osteoarthrosis patients, characterized by reduced pain and stiffness after moderate activity due to improved joint lubrication and muscle warming[1]. However, this phenomenon diminishes with disease progression, as severe joint damage leads to activity-induced exacerbation rather than relief[2]. This study investigates the osteoarthrosis-post-activity relief association and evaluates nursing interventions to optimize this effect, addressing the lack of personalized activity protocols[3].

Methods

Study design and participants

Retrospective analysis of 60 patients with radiographically confirmed osteoarthrosis (knee: 42 cases, hip: 18 cases). Inclusion criteria: age 45-80 years; Kellgren-Lawrence grade I-IV; ability to perform basic activities. Responsive group defined as ≥50% reduction in VAS pain within 30 minutes post-activity (walking 500m). Exclusion criteria: inflammatory arthritis, severe cardiovascular diseases and joint replacement history.

Grouping & interventions

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

- **Intervention subgroups: Added activity-optimizing interventions:**
- **Individualized activity prescription:** Tailored to joint type (knee: cycling; hip: swimming) and baseline function.
- **Timing adjustment:** Scheduling activities during peak stiffness periods (morning for 72% of patients) to maximize relief.
- **Intensity modulation:** Starting with 5-minute warm-up, maintaining Borg scale 3-4 (moderate exertion) and 5-minute cool-down.
- **Symptom monitoring:** Teaching patients to track relief duration/intensity via mobile app logs.

Outcome measures

- **Primary:** Correlation between Kellgren-Lawrence grade and initial relief duration; 12-week relief maintenance rate.
- **Secondary:** VAS pain change (0-10), morning stiffness duration (mins) and weekly activity adherence (≥5 sessions/week).

Statistical analysis

SPSS 26.0 used for Pearson correlation, χ^2 tests and independent t-tests. $p<0.05$ was significant.

Results

Osteoarthrosis-post-activity relief relationship and baseline data

Significant negative correlation between Kellgren-Lawrence grade and relief duration ($r=-0.68$, $p<0.01$). Responsive group had lower initial Kellgren-Lawrence grade **(Table 1)**.

Table 1: Baseline Characteristics.

Characteristics	Responsive Group (n=35)	Non-Responsive Group (n=25)	p-value
Age (years, $\bar{x}\pm s$)	62.3±8.5	64.1±7.9	0.41
Male gender, n(%)	19(54.3)	13(52.0)	0.87
Affected joint (knee/hip)	25/10	17/8	0.83
Kellgren-Lawrence grade ($\bar{x}\pm s$)	1.8±0.7	3.1±0.8	<0.001
Initial VAS (pre-activity, $\bar{x}\pm s$)	6.2±1.4	6.5±1.3	0.45
Relief duration (mins, $\bar{x}\pm s$)	42.5±11.3	12.8±7.6	<0.001
Morning stiffness (mins, $\bar{x}\pm s$)	38.2±10.5	41.3±11.2	0.32

Primary outcome

- **Severity association:** Each 1-grade increase in Kellgren-Lawrence grade correlated with 18.2-minute reduction in relief duration ($p<0.001$).
- **Intervention effect:** Intervention subgroups showed higher maintenance rate **(Table 2)**.

Table 2: 12-Week Relief Maintenance Rate.

Group	Intervention	Control	p-value
Responsive Group (n=35)	15/18(83.3%)	8/17(47.1%)	0.016
Non-Responsive Group (n=25)	8/13(61.5%)	3/12(25.0%)	0.042

Secondary outcomes

Intervention subgroups demonstrated greater improvements in all secondary measures **(Table 3)**.

Table 3: Secondary Outcomes at 12 Weeks.

Outcome	Responsive Group	Non-Responsive Group	p-value (intervention effect)
VAS reduction (post-pre, $\bar{x}\pm s$)	Intervention: 4.8±1.1	Intervention: 2.3±0.9	<0.001
	Control: 2.6±1.0	Control: 1.1±0.8	-
Stiffness duration reduction (mins)	Intervention: 28.5±8.3	Intervention: 15.2±7.1	<0.001
	Control: 14.2±7.5	Control: 6.8±5.3	-
Activity adherence, n(%)	Intervention: 16(88.9%)	Intervention: 10(76.9%)	0.038
	Control: 9(52.9%)	Control: 5(41.7%)	-

Discussion

This study confirms post-activity relief is inversely correlated with osteoarthrosis severity, consistent with preserved joint mobility in mild disease allowing beneficial lubrication and muscle activation[4]. The 3.3-fold longer relief duration in the responsive group aligns with data that severe joint space narrowing impairs mechanical benefit from activity[5].

Activity-optimizing interventions enhanced relief through personalized prescription-matching activity type to joint biomechanics maximized chondrocyte nutrient diffusion[6]. Timing adjustments capitalized on diurnal rhythm of joint fluid viscosity, while intensity modulation prevented overloading[7]. Notably, 61.5% of non-responsive intervention patients achieved partial relief, suggesting even severe cases benefit from optimized activity[8].

Limitations include reliance on self-reported relief and lack of objective joint fluid analysis. Future studies should measure synovial fluid viscosity changes post-activity.

Conclusion

Osteoarthrosis severity inversely correlates with post-activity symptom relief. Activity-optimizing nursing interventions effectively enhance relief maintenance, reduce pain/stiffness and improve adherence, with efficacy across disease stages. These strategies are critical for leveraging the therapeutic potential of activity in osteoarthrosis management.

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