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Research Article

Association Between Joint Osteophytes and Joint Stiffness-Focused

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ABSTRACT

This retrospective study explored the association between joint osteophyte severity and joint stiffness and evaluated stiffness-focused nursing interventions in 30 patients with joint osteophytes. Patients were divided into intervention group (n=15) and control group (n=15). The control group received routine nursing care, while the intervention group received additional stiffness-focused nursing interventions including structured range-of-motion exercises, thermal therapy protocols and activity timing guidance. Primary outcomes included the correlation between osteophyte severity (Larsen grade) and stiffness duration (morning stiffness and total daily stiffness time) and the change in stiffness duration at 4 weeks. Secondary outcomes included joint mobility (ROM), Lequesne Index and patient-reported functional impairment (FIQ). Results showed a significant positive correlation between Larsen grade and initial total daily stiffness time ($r=0.71$, $p<0.01$). At 4 weeks, the intervention group had a significantly greater reduction in total daily stiffness time compared to the control group (58.6±12.3 mins vs 27.4±10.5 mins, $p<0.01$). The intervention group also showed better improvement in ROM, Lequesne Index and FIQ score ($p<0.05$ for all). Stiffness-focused nursing interventions effectively reduce joint stiffness associated with osteophytes and improve patient function.

Keywords: Larsen grade; Lequesne index; Osteophytes

Introduction

Joint stiffness is a disabling symptom in patients with joint osteophytes, with 60-70% of affected individuals reporting significant morning stiffness and activity-related stiffness[1]. The relationship between osteophyte severity and stiffness is mediated by joint space narrowing and synovial changes, requiring targeted nursing strategies to address mobility limitations[2]. This study investigates the correlation between osteophytes and stiffness and evaluates stiffness-specific interventions, addressing the lack of focused nursing protocols for this symptom[3].

Methods

Study design and participants

Retrospective analysis of 30 patients with radiographically confirmed joint osteophytes (knee: 21 cases, hip: 9 cases). Inclusion criteria: age 50-75 years; Larsen grade I-IV osteophytes; presence of joint stiffness (>30 mins morning stiffness or >2 hrs daily stiffness). Exclusion criteria: inflammatory arthritis, joint contractures and neurological disorders affecting mobility.

Grouping & interventions

Control group: Routine nursing care (general mobility advice, pain assessment, medication reminders).

Intervention group: Added stiffness-focused interventions

- **Structured ROM exercises:** Gentle stretching sequences (3 sets/day) targeting affected joints, with progressive intensity based on tolerance.
- **Thermal therapy protocol:** Warm compresses (40-42°C) for 15 mins pre-exercise, followed by cold compresses post-activity.
- **Activity timing guidance:** Scheduling daily activities during periods of minimal stiffness, with rest breaks to prevent stiffness exacerbation.
- **Self-management training:** Teaching patients to recognize early stiffness signs and perform preventive exercises.

Outcome measures

- **Primary:** Correlation between Larsen grade and initial stiffness duration (morning stiffness in mins; total daily stiffness time in mins); change in total daily stiffness time at 4 weeks.
- **Secondary:** Joint ROM (degrees), Lequesne Index, Functional Impairment Questionnaire (FIQ) score (0-100, higher=worse).

Statistical analysis

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

Results

Association between osteophytes and stiffness

Significant positive correlations were found between Larsen grade and morning stiffness duration ($r=0.65$, $p<0.01$) and total daily stiffness time ($r=0.71$, $p<0.01$).

Baseline characteristics

No significant differences in baseline characteristics between groups **(Table 1)**.

Table 1: Baseline Characteristics.

Characteristics	Intervention Group (n=15)	Control Group (n=15)	p-value
Age (years, $\bar{x}\pm s$)	62.3±7.5	63.1±8.2	0.782
Gender (male/female, n)	9/6	8/7	0.763
Affected joint (knee/hip, n)	11/4	10/5	0.731
Larsen grade (I/II/III/IV, n)	2/7/4/2	3/6/4/2	0.925
Morning stiffness (mins, $\bar{x}\pm s$)	42.5±11.3	44.2±10.8	0.689
Total daily stiffness time (mins, $\bar{x}\pm s$)	85.6±18.4	88.3±17.6	0.712
ROM (degrees, $\bar{x}\pm s$)	68.3±12.5	66.7±13.1	0.735

Discussion

This study confirmed a strong positive correlation between joint osteophyte severity and stiffness duration, consistent with mechanisms involving osteophyte-induced joint space narrowing and synovial thickening[4]. The stiffness-focused interventions addressed key pathophysiological factors: structured ROM exercises prevented adhesions and maintained joint mobility[5], while pre-exercise thermal therapy increased tissue extensibility through collagen relaxation[6].

The significant reduction in stiffness in the intervention group (58.6 mins vs 27.4 mins) aligns with evidence that consistent stretching programs reduce osteophyte-related stiffness by 40-50%[7]. Activity timing guidance minimized stiffness exacerbation during peak functional periods, enhancing patient confidence and adherence[8].

Notably, improved ROM in the intervention group translated to better functional outcomes, as measured by Lequesne Index and FIQ. This highlights the importance of stiffness reduction as a pathway to improved function, beyond pain management alone[9].

Limitations include small sample size, single-center design and lack of long-term follow-up. Future studies should explore the sustainability of these interventions and their effect on slowing stiffness progression.

Conclusion

Joint osteophyte severity correlates significantly with joint stiffness duration. Stiffness-focused nursing interventions effectively reduce stiffness, improve joint mobility and enhance functional status. These strategies should be integrated into nursing care for osteophyte patients to address this disabling symptom.

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