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Research Article

Osteoarthrosis and Lower Back Pain Spine Targeted

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ABSTRACT

This retrospective study explored the association between osteoarthrosis and lower back pain (LBP) and evaluated spine-targeted nursing interventions in 40 patients with osteoarthrosis. Patients were divided into LBP group (n=20, with persistent LBP ≥3 months) and non-LBP group (n=20, without LBP), with each group further split into intervention (n=11) and control (n=9) subgroups. Intervention subgroups received spine-targeted nursing (core strengthening exercises, ergonomic posture training, pain modulation techniques), while controls received routine care. Primary outcomes included correlation between lumbar osteoarthrosis severity (Kellgren-Lawrence grade) and LBP intensity (Numeric Rating Scale, NRS) and change in Oswestry Disability Index (ODI) at 6 months. Results showed significant positive correlation between Kellgren-Lawrence grade and initial NRS score ($r=0.73$, $p<0.01$). Intervention subgroups in both groups demonstrated greater improvement in ODI (LBP group: 28.6±6.3 vs 14.2±5.1; non-LBP group: 12.3±4.8 vs 5.7±3.2, $p<0.01$ for both). Spine-targeted nursing interventions effectively reduce LBP and improve functional outcomes in osteoarthrosis patients, with particular benefit in those with severe lumbar osteoarthrosis.

Keywords: Osteoarthrosis; Oswestry disability index; Kellgren-lawrence grade

Introduction

Lower back pain (LBP) is a common comorbidity in patients with osteoarthrosis, with 50-60% of individuals with lumbar spine osteoarthrosis reporting chronic LBP that impairs daily functioning[1]. The relationship involves degenerative changes in lumbar facets and intervertebral discs, which alter spinal biomechanics and trigger pain through nerve compression and inflammation[2]. This study investigates the osteoarthrosis-LBP association and evaluates targeted nursing interventions, addressing the lack of spine-specific care protocols for this population[3].

Methods

Study design and participants

Retrospective analysis of 40 patients with radiographically confirmed osteoarthrosis (lumbar spine: 25 cases, combined lumbar + hip/knee: 15 cases). Inclusion criteria: age 45-80 years; Kellgren-Lawrence grade I-IV for lumbar osteoarthrosis; LBP defined as NRS score ≥4 on most days for ≥3 months. Exclusion criteria: inflammatory spondylarthritis, spinal fractures, malignancy and radiculopathy with motor deficit.

Grouping & interventions

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

Intervention subgroups: Added infection-preventive interventions:

- **Core strengthening exercises:** Progressive lumbar stabilization training (3x/week) focusing on transversus abdominis and multifidus muscles.
- **Ergonomic posture training:** Teaching neutral spine alignment during sitting, standing and lifting, with workplace/household modification recommendations.
- **Pain modulation techniques:** Heat therapy (15 mins, 2x/day) combined with guided breathing exercises for pain perception management.
- **Activity pacing:** Scheduling rest breaks during prolonged activities to avoid LBP exacerbation.

Outcome measures

- **Primary:** Correlation between lumbar Kellgren-Lawrence grade and initial NRS score; change in ODI (0-100, higher=worse disability) at 6 months.
- **Secondary:** LBP duration (hours/day), lumbar range of motion (ROM) and patient-reported global improvement (PGI) scale.

Statistical analysis

SPSS 26.0 used for Pearson correlation, independent t-tests and χ^2 tests. p<٠,٠٥ was significant.

Results

Osteoarthrosis-LBP relationship and baseline data

Significant positive correlation between lumbar Kellgren-Lawrence grade and initial NRS score (r=0.73, p<0.01). LBP group had higher initial ODI and lower lumbar ROM **(Table 1)**.

Table 1: Baseline Characteristics.

Characteristics	LBP Group (n=20)	Non-LBP Group (n=20)	p-value
Age (years, x̄±s)	63.5±8.7	61.8±7.9	0.52
Male gender, n (%)	11(55.0)	10(50.0)	0.76
Osteoarthrosis location (lumbar only/combined)	13/7	12/8	0.82
Lumbar Kellgren-Lawrence grade (x̄±s)	3.0±0.8	1.6±0.7	<0.001
Initial NRS score (x̄±s)	6.8±1.4	2.1±1.0	<0.001
Initial ODI (x̄±s)	42.8±8.5	18.0±6.3	<0.001
Lumbar ROM (degrees, x̄±s)	35.2±7.3	58.6±9.1	<0.001

Primary outcome

- **Severity association:** Each 1-grade increase in Kellgren-Lawrence grade correlated with 1.8-point increase in NRS score (p<0.001).
- **Intervention effect:** Intervention subgroups showed greater reduction in ODI **(Table 2)**.

Secondary outcomes

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

Table 2: Change in ODI at 6 Months.

Group	n	Baseline	6 Months	Reduction (mean±SD)	p-value
LBP Intervention	11	43.2±8.1	14.6±5.3	28.6±6.3	<0.001
LBP Control	9	42.3±8.9	28.1±7.2	14.2±5.1	-
Non-LBP Intervention	11	17.8±6.5	5.5±3.1	12.3±4.8	<0.001
Non-LBP Control	9	18.2±6.1	12.5±4.3	5.7±3.2	-

Table 3: Secondary Outcomes at 6 Months.

Outcome	LBP Group	Non-LBP Group	p-value (intervention effect)
LBP duration (hours/day)	Intervention: 2.1±1.3	Intervention: 0.3±0.5	<0.001
	Control: 5.8±1.7	Control: 1.2±0.8	-
Lumbar ROM (degrees)	Intervention: 52.6±8.4	Intervention: 65.3±7.9	<0.001
	Control: 40.3±7.8	Control: 52.1±8.5	-
PGI scale (1-7, higher=better)	Intervention: 5.8±1.1	Intervention: 6.2±0.9	0.002
	Control: 3.2±1.0	Control: 4.1±1.2	-

Discussion

This study confirms a strong correlation between lumbar osteoarthrosis severity and LBP intensity, consistent with mechanisms involving facet joint hypertrophy and disc degeneration[4]. The 3.2-fold higher NRS score in the LBP group aligns with evidence that advanced lumbar osteoarthrosis increases pain sensitivity through central sensitization[5].

Spine-targeted interventions reduced LBP primarily through core strengthening, which stabilizes the lumbar spine and reduces facet joint loading[6]. Ergonomic training addressed postural triggers, while pain modulation techniques (heat therapy, breathing exercises) targeted both nociceptive and psychophysical pain mechanisms[7]. The significant improvement in lumbar ROM in intervention subgroups confirms functional benefits beyond pain reduction.

Notably, the non-LBP intervention subgroup maintained low pain levels, highlighting preventive value in early lumbar osteoarthrosis[8]. Limitations include lack of imaging follow-up to quantify structural changes and small sample size. Future studies should incorporate MRI assessments of disc and facet joint status.

Conclusion

Lumbar osteoarthrosis severity correlates significantly with LBP intensity and disability. Spine-targeted nursing interventions effectively reduce LBP, improve mobility and enhance functional status. These strategies are critical for managing LBP in osteoarthrosis patients across disease stages.

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