

Correlation between Joint Osteophyte Severity and Efficacy of Age Appropriate

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ABSTRACT

This retrospective study explored the correlation between joint osteophyte severity and natural aging and evaluated age-appropriate nursing interventions in 30 patients with joint osteophytes. Patients were stratified into middle-aged group (45-64 years, n=15) and elderly group (≥ 65 years, n=15), with each group divided into intervention (n=8) and control (n=7) subgroups. Intervention subgroups received age-appropriate nursing (adjusted exercise intensity, multimorbidity management, geriatric syndrome prevention), while controls received routine care. Primary outcomes included correlation between age and osteophyte severity (Larsen grade) and change in Lequesne Index at 6 months. Results showed significant positive correlation between age and initial Larsen grade ($r=0.67$, $p<0.01$). Intervention subgroups in both age strata demonstrated greater improvement in Lequesne Index (middle-aged: 12.5 ± 3.2 vs 6.8 ± 2.7 ; elderly: 10.3 ± 2.9 vs 5.1 ± 2.3 , $p<0.01$ for both). Age-appropriate nursing interventions effectively improve outcomes in age-related joint osteophytes, with tailored strategies addressing age-specific physiological changes.

Keywords: Osteoarthritis; Larsen grade; Geriatric syndrome prevention; Lequesne index

Introduction

Natural aging is the strongest non-modifiable risk factor for joint osteophytes, with prevalence increasing from 15% in adults <50 years to 70% in those ≥ 70 years¹. Age-related changes (chondrocyte senescence, extracellular matrix degradation and reduced periarticular muscle mass) accelerate osteophyte formation and progression². This study investigates the age-osteophyte correlation and evaluates nursing interventions tailored to different age groups, addressing the lack of age-stratified nursing protocols³.

Methods

Study design and participants

Retrospective analysis of 30 patients with radiographically confirmed joint osteophytes (knee: 21 cases, hip: 9 cases). Inclusion criteria: age 45-85 years; Larsen grade I-IV osteophytes; no history of joint trauma or inflammatory arthritis. Exclusion criteria: metabolic bone diseases, joint surgery history and cognitive impairment precluding intervention compliance.

Grouping & interventions

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

Intervention subgroups: Age-appropriate interventions:

- **Middle-aged group:** Moderate-intensity resistance training (3x/week), workplace ergonomics guidance and metabolic risk factor control (weight/BMI monitoring).
- **Elderly group:** Low-impact aquatic exercise, fall prevention programs, polypharmacy review (to avoid drug-induced myopathy) and sarcopenia screening with protein supplementation.
- **Both groups:** Joint protection education, progressive activity pacing and symptom self-management training.

Outcome measures

- **Primary:** Correlation between age and initial Larsen grade; change in Lequesne Index (0-24, higher=worse) at 6 months.
- **Secondary:** Muscle strength (handheld dynamometry), Timed Up and Go (TUG) test and geriatric nutritional risk index (GNRI) in elderly subgroup.

Statistical analysis

SPSS 26.0 used for Pearson correlation, independent t-tests and two-way ANOVA. p<0.05 was significant.

Results

Age-osteophyte correlation and baseline data

Significant positive correlation between age and initial Larsen grade (r=0.67, p<0.01). No significant differences in baseline characteristics within age strata (Table 1).

Table 1: Baseline Characteristics by Age Group.

Characteristics	Middle-aged (45-64y, n=15)	Elderly (≥65y, n=15)	p-value
Mean age (years)	56.3±7.2	72.5±6.8	<0.001
Male gender, n(%)	9(60.0)	7(46.7)	0.45
Affected joint (knee/hip)	11/4	10/5	0.82
Initial Larsen grade	1.8±0.6	2.9±0.8	<0.001
Initial Lequesne Index	18.2±4.1	21.5±3.8	0.012
Muscle strength (kg)	27.5±5.3	20.8±4.6	<0.001

Primary outcome

Greater improvement in Lequesne Index in intervention subgroups across both age groups (Table 2).

Table 2: Change in Lequesne Index at 6 Months.

Group	n	Baseline	6 Months	Change (mean±SD)	p-value
Middle-aged Intervention	8	17.8±3.9	5.3±2.1	12.5±3.2	<0.001
Middle-aged Control	7	18.6±4.2	11.8±3.1	6.8±2.7	-
Elderly Intervention	8	21.2±3.7	10.9±2.8	10.3±2.9	<0.001
Elderly Control	7	21.8±4.0	16.7±3.5	5.1±2.3	-

Secondary outcomes

Intervention subgroups showed significant improvements in muscle strength and TUG test, with elderly intervention subgroup demonstrating higher GNRI (Table 3).

Discussion

This study confirms a strong positive correlation between natural aging and osteophyte severity, consistent with age-related chondrocyte senescence and matrix degradation mechanisms⁴. The 61% higher Larsen grade in the elderly group aligns

with epidemiological data showing exponential osteophyte progression after 65 years⁵.

Table 3: Secondary Outcomes at 6 Months.

Outcome	Middle-aged Group	Elderly Group	p-value (intervention effect)
Muscle strength (kg)	Intervention: 32.6±4.8	Intervention: 24.5±4.1	<0.001
	Control: 28.1±5.2	Control: 21.2±3.9	-
TUG test (sec)	Intervention: 8.2±1.5	Intervention: 11.3±2.1	<0.001
	Control: 10.5±2.0	Control: 15.7±2.8	-
GNRI (elderly only)	-	Intervention: 98.6±5.3	0.002
	-	Control: 90.2±6.7	-

Age-appropriate interventions addressed key age-specific factors: middle-aged patients benefited from resistance training to counter early muscle loss, while elderly patients required low-impact exercise to balance mobility and fall risk⁶. Polypharmacy review in the elderly subgroup reduced use of medications (e.g., long-term glucocorticoids) that exacerbate muscle weakness and joint degeneration⁷.

Notably, the elderly intervention subgroup showed significant GNRI improvement, highlighting the role of nutrition in maintaining musculoskeletal health during aging-a factor often overlooked in standard osteophyte care⁸. The smaller absolute improvement in the elderly group reflects irreversible age-related changes, emphasizing the importance of early intervention.

Limitations include small sample size and lack of histopathological confirmation of age-related chondrocyte changes. Future studies should incorporate biomarkers of cellular senescence to better quantify the aging-osteophyte relationship.

Conclusion

Joint osteophyte severity correlates significantly with natural aging. Age-appropriate nursing interventions effectively improve functional outcomes by addressing age-specific physiological changes (muscle loss, multimorbidity, nutritional decline). These strategies should be integrated into nursing care to optimize outcomes across the age spectrum.

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