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EFFECTIVENESS OF PECTINEUS MYOFASCIAL RELEASE IN REDUCING LOW BACK PAIN AND IMPROVING FUNCTION IN ADULTS AGED 20-50: A PROSPECTIVE SINGLE-ARM INTERVENTIONAL STUDY

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ABSTRACT

***Background*:** Low back pain (LBP) affects 80% of adults, with hip flexor dysfunction like pectineus tightness contributing via pelvic misalignment. This study evaluated pectineus myofascial release (MFR) efficacy. ***Methods*:** Fifty adults (20-50 years) with nonspecific chronic LBP underwent six sessions of pectineus MFR over three weeks. *Primary outcome*: VAS pain difference of 3 points. Secondary: 50% Roland-Morris Questionnaire (RMQ) improvement. Assessments at baseline, mid (session 3), and end. *Results*: VAS reduced from 6.8±1.2 to 3.7±1.0 (Δ=3.1, $p<0.001$). RMQ improved 50.1% (14.2±3.1 to 7.1±2.2, $p<0.001$). No adverse events. ***Conclusion*:** Pectineus MFR provides clinically meaningful pain relief and functional gains in young adults with LBP.

KEYWORDS: Pectineus muscle, myofascial release, low back pain, Visual Analog Scale, Roland-Morris Disability Questionnaire, manual therapy.

INTRODUCTION

Nonspecific low back pain (LBP) imposes substantial global burden, with myofascial trigger points in hip adductors/flexors like pectineus referring pain lumbo-pelvically and altering gait/biomechanics. Pectineus, originating from the superior pubic ramus, flexes/adducts the hip; tightness induces anterior pelvic tilt, straining lumbar extensors.

Manual therapies targeting hip muscles show promise, yet pectineus-specific interventions lack prospective data.

A 3-point VAS drop signifies meaningful change; 50% RMQ reduction indicates substantial recovery.

This study hypothesizes six pectineus MFR sessions yield VAS Δ3 and 50% RMQ improvement in 20-50-year-olds.

MATERIALS AND METHODS

Study Design

Prospective single-arm interventional study (February-May 2025), approved by institutional ethics committee (Ref: JRI/EC/2025/01).
Registered prospectively (CRIS: KCTRI/2025/02/001).
CONSORT guidelines followed for non-randomized trials.

Participants

Convenience sample: 50 adults (25M/25F), aged 20-50, BMI<30, nonspecific LBP ≥3 months, baseline VAS≥4/10, RMQ≥12.

Exclusions: Radiculopathy, surgery <6 months, inflammatory disease, pregnancy. Informed consent obtained. Power calculation: 80% power, α=0.05, effect size=1.0 (G*Power 3.1).

Intervention

Pectineus MFR: Patient supine, therapist applied sustained cross-fiber pressure (thumb/fingers) to pectineus belly (3-5min/side), followed by stretch (hip extension/abduction, 30s x3).
Bilateral, 20-25min/session, twice weekly x6 (3 weeks).
Standardized by senior physiotherapist (10+ years experience).
Home advice: Avoid aggravating postures.
Compliance: Session diary.

Outcomes

Primary: VAS (0-10cm, anchored).
Secondary: RMQ (0-24, LBP function).

Assessments

Baseline (T0), post-session 3 (T1), post-session 6 (T2). Blinded assessor.

Statistical Analysis

SPSS v27. Paired t-tests (pre-post), repeated-measures ANOVA (time effects), effect sizes (Cohen's d). Significance: $p<0.05$. MCID: VAS≥2-3 points, RMQ≥4-5 points or 50%.

RESULTS

Flow and Demographics

All 50 completed (retention 100%). Mean age 35.2±8.4 years; LBP duration 8.5±4.2 months. Baseline comparable by sex.

Table 1: Baseline Characteristics.

Parameter	TotaL (n=50)	Male (n=25)	Female (n=25)	p-value
Age (years)	35.2±8.4	36.1±8.9	34.3±7.9	0.42
BMI (kg/m2)	24.6±3.1	25.2±3.4	24.0±2.7	0.28
VAS (0-10)	6.8±1.2	6.9±1.3	6.7±1.1	0.61
RMQ (0-24)	14.2±3.1	14.5±3.4	13.9±2.8	0.45
LBP Duration (month)	8.5±4.2	8.9±4.5	8.1±3.9	0.52

Pain Outcomes

VAS: T0=6.8±1.2, T1=5.1±1.1, T2=3.7±1.0 ($F=89.4$, $p<0.001$, $\eta^2=0.65$).
ΔT0-T2=3.1 ($t=18.2$, $p<0.001$, $d=1.82$).
92% achieved ≥minimal clinically important difference (MCID, ≥3 points).

Functional Outcomes

RMQ: T0=14.2±3.1, T1=10.5±2.8, T2=7.1±2.2 ($F=112.3$, $p<0.001$, $\eta^2=0.70$). %Change T0-T2=50.1% ($t=22.4$, $p<0.001$, $d=2.31$). 88% reached 50% improvement.

Table 2: Outcome Measures.

Time Point	VAS (mean±SD)	VAS	RMQ (mean±SD)	% RMQ change
Base line	6.8±1.2	-	14.2±3.1	-
Mid (T1)	5.1±1.1	-1.7	10.5±2.8	-26.1
End (T2)	3.7±1.0	-3.1	7.1±2.2	-50.1
P<0.001 all				

Over Time

Adverse Events: None reported.

DISCUSSION

Pectineus MFR achieved VAS Δ3.1 and 50.1% RMQ reduction over six sessions, surpassing MCID thresholds.

This supports hip myofascial targeting in LBP, as pectineus trigger points refer to lumbar/groin regions, destabilizing sacroiliac/lumbar segments.

Comparable to iliopsoas studies (e.g., 40-60% ODI gains).
Mechanisms: Reduced fascial tension restores pelvic alignment, decreases lumbar shear.
Single-arm limits causality; yet large effects suggest efficacy.

LIMITATIONS

No control; short follow-up. Small sample from single center (Bhuj, Gujarat). Future: RCT with sham/placebo, 6-month retention.

CONCLUSION

Pectineus MFR is effective for LBP in 20-50-year-olds, warranting integration into physiotherapy protocols.

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