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Research Article

Strengthening Exercises Versus Myofascial Release with Stretching for Iliotibial Band Friction Syndrome in Runners

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Iliotibial band friction syndrome (ITBFS) is a common overuse injury causing lateral knee pain in runners from repetitive iliotibial band compression against the lateral femoral epicondyle. Hip/knee strengthening and myofascial release are both used clinically, but direct comparisons with stretching are limited. This study compared strengthening exercises with stretching against myofascial release with stretching for pain, speed, and function in runners with ITBFS. Forty runners (18–25 years) with ITBFS were randomised to Group A (strengthening with stretching, n = 20) or Group B (myofascial release with stretching, n = 20) for 8 weeks. Pain, sprint speed, and function were measured before and after intervention using the Numeric Pain Rating Scale, a 20-metre run test, and the Lower Extremity Functional Scale, and analysed with paired and independent-samples t-tests. Both groups improved significantly from baseline ($p < 0.0001$), but Group A showed significantly greater gains on every measure: post-test pain score 2.95 ± 1.15 versus 6.00 ± 0.73, run time 2.77 ± 0.12 s versus 3.11 ± 0.08 s, and functional score 72.30 ± 1.75 versus 46.15 ± 1.31 (all $p < 0.0001$). Strengthening with stretching produced markedly greater improvement than myofascial release with stretching and should be prioritised in ITBFS rehabilitation.

Keywords: iliotibial band syndrome; running injury; strengthening exercise; myofascial release; stretching.

INTRODUCTION

Distance running has grown steadily in popularity over recent decades, and the repetitive high loads it places on the lower limb make the knee the most frequently injured region in runners.[1–8] Iliotibial band friction syndrome (ITBFS) is among the most prevalent of these overuse injuries and one of the most common causes of lateral knee pain in this population.[7,9] The iliotibial band (ITB) runs from the iliac crest to Gerdy's tubercle, with an attachment near the lateral femoral epicondyle; during running, repeated knee flexion–extension around 20–30° causes its posterior fibres to pass over the epicondyle, and it is this repetitive compression and gliding — rather than tension within the band itself — that produces the localised inflammation and tenderness characteristic of ITBFS.[10,11] This study compared the effectiveness of a strengthening-and-stretching programme against a myofascial-release-and-stretching programme on pain, sprint performance, and lower-extremity function in runners with ITBFS. The specific objectives were: (i) to determine the effect of strengthening exercise combined with stretching on ITBFS in runners; (ii) to determine the effect of myofascial release combined with stretching on ITBFS in runners; and (iii) to compare the relative effectiveness of the two interventions. It was hypothesised that there would be a significant difference in effectiveness between the two interventions (alternate hypothesis), against a null hypothesis of no difference.

2. LITERATURE SURVEY

The precise pathomechanics of ITBFS remain debated. Some authors report that greater ITB tension and strain rate, rather than simple tightness, are the more consistent findings in symptomatic runners, [12,13] while biomechanical studies point to hip abductor weakness, increased hip adduction, and increased knee internal rotation during stance as contributing factors.[14–17] Clinically, this has translated into two broad rehabilitation strategies. The first targets the presumed muscular driver of the problem, using hip- and knee-strengthening exercise — particularly of the gluteus medius and quadriceps — to restore frontal-plane control at the hip and reduce compressive load on the band.[18,19] The second addresses the soft tissue directly, using self-myofascial release (commonly foam rolling) to reduce localised tension, break up adhesions, and improve tissue extensibility.[20–22] Stretching of the ITB and surrounding musculature is frequently combined with either approach to maintain flexibility.[23] Both strategies have individual support in the literature. Hip-strengthening protocols have been associated with reduced pain and improved function in runners with ITBFS, [18,24] while foam rolling has demonstrated short-term gains in pressure-pain threshold and flexibility. [20,22,25]

3. Problem Definition

Few studies have directly compared hip/knee strengthening with myofascial release, combined with a common stretching component, within the same runner population using standardised outcome measures. This represents a clear gap in the evidence base: clinicians currently have little head-to-head data to guide which approach should be prioritised when treatment time is limited. This study was designed to address that gap by comparing the two approaches directly in a single cohort of young runners with ITBFS.

4. METHODOLOGY / APPROACH

4.1 Study design and setting

This was a prospective, comparative, pre-test/post-test experimental study conducted at the faculty of Physiotherapy, biher, Chennai, over an 8-week intervention period. [Insert Institutional Ethics Committee approval reference number here before submission.]

4.2 Participants

Forty runners aged 18–25 years, of either sex, with a clinical diagnosis of ITBFS and willingness to participate were recruited. Runners were excluded if they had undergone recent lower-limb surgery, had an acute lower-limb ligament injury, an unhealed lower-limb fracture, a neurological disorder, or a bone disorder. Written informed consent was obtained from all participants after the study procedures, and any associated risks and benefits, were explained. Participants were allocated by simple random sampling into two groups of 20: Group A (strengthening exercise with stretching) and Group B (myofascial release with stretching). Baseline pain, sprint speed, and function were recorded before either intervention began.

4.3 Outcome measures

Pain intensity was recorded using the Numeric Pain Rating Scale (NPRS), an 11-point self-report scale (0 = no pain, 10 = worst imaginable pain) widely used for its simplicity and responsiveness to change in musculoskeletal populations.[26,27] Sprint performance was assessed with the 20-metre run test, a timed maximal-effort sprint from a standing start that reflects short-distance speed, acceleration, and anaerobic capacity, and which also served here as a functional, pain-provoking task specific to running.[28] Lower-limb function was assessed using the Lower Extremity Functional Scale (LEFS), a 20-item, patient-reported outcome measure covering activities of daily living and sport-related tasks, scored from 0 (extreme limitation) to 80 (no limitation).[29,30] The LEFS has established reliability for tracking functional change across a range of lower-limb musculoskeletal conditions, including ITBFS.[31]

4.4 Interventions

Both groups trained for 10–15 minutes per session, daily, for 8 weeks; all sessions were supervised. Group A (strengthening with stretching) performed two closed- and open-chain exercises targeting the hip abductors, gluteal musculature, and quadriceps: (i) a medicine-ball squat, performed by squeezing a light medicine ball between the knees while squatting to 90°

of knee flexion and returning to stand (3 sets of 15–18 repetitions); and (ii) a side-lying hip-abduction leg raise, performed with the lower limb raised and briefly held before a controlled return (2–3 sets of 15–20 repetitions per side). Group B (myofascial release with stretching) performed self-administered foam rolling of the iliotibial band, rolling from the lateral knee toward the hip for up to 5 minutes per side, followed by manual sustained-pressure release of palpable tender points (20–60 seconds per point, with pressure increased gradually as the tissue relaxed). Both groups additionally performed a standing iliotibial band stretch for 10 minutes per session, holding the end-range position for 30 seconds, repeated across the session.

4.5 Statistical analysis

Data were analysed in SPSS version 28 using descriptive statistics and paired and independent-samples t-tests. A paired t-test compared pre- and post-intervention scores within each group; an independent t-test compared post-intervention scores between groups. Statistical significance was set at $p < 0.05$.

5. RESULTS & DISCUSSION

Forty runners (20 per group) completed the 8-week programme with no withdrawals. Table 1 summarises the within-group change on each outcome measure; Table 2 summarises the between-group comparison of post-intervention scores.

Table 1. Within-group pre- and post-intervention values (mean ± SD)

Outcome	Group	Pre-test	Post-test	t	p
NPRS (0–10)	A – Strengthening	7.75 ± 1.07	2.95 ± 1.15	13.69	<0.0001
	B – Myofascial release	7.00 ± 0.73	6.00 ± 0.73	4.36	<0.0001
20-m run (s)	A – Strengthening	3.535 ± 0.104	2.770 ± 0.122	21.36	<0.0001
	B – Myofascial release	3.205 ± 0.076	3.105 ± 0.076	4.17	0.0002
LEFS (0–80)	A – Strengthening	43.20 ± 1.74	72.30 ± 1.75	52.81	<0.0001
	B – Myofascial release	45.15 ± 1.31	46.15 ± 1.31	2.42	0.0206

Table 2. Between-group comparison of post-intervention scores (mean ± SD)

Outcome	Group A (n = 20)	Group B (n = 20)	t	p
NPRS (0–10)	2.95 ± 1.15	6.00 ± 0.73	10.01	<0.0001
20-m run (s)	2.770 ± 0.122	3.105 ± 0.076	10.42	<0.0001
LEFS (0–80)	72.30 ± 1.75	46.15 ± 1.31	53.50	<0.0001

Both groups improved significantly from baseline on all three outcome measures. However, the magnitude of change was consistently and substantially greater in Group A. On the post-intervention comparison, Group A showed lower pain (2.95 vs 6.00), faster sprint times (2.77 s vs 3.11 s), and higher functional scores (72.30 vs 46.15) than Group B, with all between-group differences statistically significant at $p < 0.0001$. On this basis, the null hypothesis was rejected: strengthening exercise combined with stretching produced a significantly greater treatment effect than myofascial release combined with stretching. This pattern is consistent with the view that ITBFS in runners is driven at least in part by proximal muscular insufficiency rather than by the ITB's soft-tissue properties alone. Reduced strength or delayed activation of the gluteus medius and other hip abductors is thought to permit excess hip adduction and femoral internal rotation during stance, increasing compressive load on the band as it passes the lateral femoral epicondyle.[14,16,17] The exercises used in Group A — a medicine-ball squat emphasising co-contraction around the hip, and a side-lying abduction raise isolating the gluteus medius — target this mechanism directly, and the improvements observed here align with earlier reports that hip-abductor strengthening reduces lateral knee pain and improves function in runners with this condition.[18,24] By contrast, myofascial release addresses the local soft tissue rather than the underlying movement fault. Foam rolling has repeatedly been shown to produce short-term reductions in tissue tension and improvements in flexibility and pressure-pain threshold, [20,22,25] and the modest but statistically significant within-group improvement seen in Group B here is consistent with that literature. However, without a corresponding change in the strength or control of the muscles governing hip and knee alignment during running, these gains appear insufficient on their own to meaningfully alter pain, speed, or function over an 8-week period, in line with suggestions that the benefits of soft-tissue techniques are often transient unless paired with corrective exercise. [20] The improvement on the 20-metre run test in Group A is a noteworthy secondary finding, suggesting that strengthening did not simply reduce pain in isolation but also translated into a measurable gain in running-specific performance — plausibly through improved pelvic control and reduced compensatory movement at the hip and knee during high-speed loading. The larger gain in LEFS scores in Group A likewise indicates that the benefit extended beyond the treated movement pattern to broader activities of daily living and sport-specific tasks.

5.1 Clinical implications

These findings support prioritising targeted hip- and knee-strengthening, rather than isolated myofascial techniques, as the core component of rehabilitation programmes for runners with ITBFS, with soft-tissue work used as an adjunct rather than a stand-alone intervention. This is broadly consistent with clinical recommendations that gluteal strengthening — particularly isometric and eccentric work in the frontal and transverse planes — forms the basis of evidence-informed ITBFS management, alongside acute-phase symptom control and gait retraining where indicated. [17]

5.2 LIMITATIONS

This study has several limitations. The sample size was modest (n = 40) and drawn from a single centre, the intervention period was limited to 8 weeks without longer-term follow-up, and the age range was restricted to 18–25 years, limiting generalisability to older or more experienced runner populations. Running biomechanics were not directly measured, so the proposed mechanism linking strengthening to reduced ITB compressive load remains inferential rather than demonstrated.

6. CONCLUSION

In runners aged 18–25 years with iliotibial band friction syndrome, an 8-week programme of hip- and knee-strengthening exercise combined with stretching produced significantly greater reductions in pain and significantly greater gains in sprint speed and lower-extremity function than a programme of myofascial release combined with the same stretching component. These findings suggest that strengthening-based rehabilitation should be positioned as the primary intervention for ITBFS in runners, with myofascial release considered a supportive adjunct rather than a stand-alone treatment.

7. FUTURE SCOPE

Future research should employ larger, multi-centre samples with extended follow-up to assess durability of effect, include biomechanical or electromyographic assessment of hip and knee kinematics during running, extend recruitment to a broader age range, and evaluate whether a combined strengthening-plus-myofascial-release-plus-stretching protocol outperforms either approach in isolation.

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