

Effectiveness Of Myofascial Release Using IASTM Along With Static Stretching On Pain And Functional Ability Among Subjects With Latissimus Dorsi Tightness Leading To Mechanical Back Pain.

Devi S¹, Selleswaran V², Dharani M³, N Muthukumaran⁴, kushmitha B⁵, Shanmugananth Elayaperumal⁶

¹Assistant Professor, School of Physiotherapy, Sri Balaji Vidyapeeth (Deemed to be University), Puducherry.

²Assistant Professor, SSM College of Physiotherapy, Erode.

³Physiotherapist, Abhinav bindra targeting performance - Ortho One, Coimbatore.

⁴Lecturer, Faculty of health sciences, Nursing & Education, MAHSA University, Malaysia.

⁵Assistant Professor, School of Physiotherapy, Sri Balaji Vidyapeeth (Deemed to be University), Puducherry.

⁶Professor and Principal, School of Physiotherapy, Sri Balaji Vidyapeeth (Deemed to be University), Puducherry.

Corresponding author; Selleswaran V, Assistant Professor, SSM College of Physiotherapy

E mail- sellesvijay96@gmail.com

ABSTRACT

Objective: To evaluate the effectiveness of instrument-assisted soft tissue manipulation (IASTM) combined with static stretching on latissimus dorsi tightness in individuals with mechanical low back pain.

Materials and Methods: This study included 30 subjects diagnosed with latissimus dorsi tightness contributing to mechanical low back pain. Participants underwent a treatment regimen consisting of IASTM and static stretching exercises over a period of 4 weeks. The primary outcomes measured were pain intensity, using the Visual Analogue Scale (VAS), and functional ability, assessed by the Quebec Disability Pain Scale. Pre- and post-intervention values were recorded and analysed to determine the efficacy of the treatment.

Results: The mean VAS scores for pain decreased significantly from 8 (pre-test) to 4.8 (post-test), with a T value of 5.070, indicating a substantial reduction in pain levels. Similarly, the mean scores on the Quebec Disability Pain Scale improved from 67 (pre-test) to 29.6 (post-test), with a T value of 4.655, demonstrating enhanced functional ability.

Conclusion: The study concluded that the application of instrument-assisted soft tissue manipulation in conjunction with static stretching significantly improves functional ability and reduces pain in individuals with latissimus dorsi tightness and mechanical low back pain.

Keywords: Myofascial release, Instrument-assisted soft tissue manipulation, Latissimus dorsi tightness, Mechanical low back pain, Static stretching exercise.

INTRODUCTION

Low back pain (LBP) is a prevalent and significant health issue, affecting approximately 80% of adults at some point in their lives and ranking as the leading cause of job-related disability⁽¹⁾. The lumbar region of the spine, which supports much of the upper body's weight, is particularly susceptible to pain and discomfort due to its structural and functional roles⁽²⁾, including providing support, enabling movement, and protecting vital tissues⁽³⁾.

Mechanical low back pain, characterized by pain that varies with certain positions or activities, is especially common, impacting over 90% of individuals at some stage in their lives⁽⁴⁾. It often arises from intrinsic factors related to the spine, intervertebral discs, or surrounding soft tissues, and can be triggered by improper lifting, poor posture, lack of regular exercise, or acute injuries such as muscle strains or ligament sprains⁽⁵⁾.

Despite the self-limiting nature of many LBP episodes, with most resolving within a 12-week period⁽⁶⁾, a significant proportion of individuals develop chronic symptoms, which contribute substantially to

healthcare costs and lost productivity⁽⁷⁾. Chronic LBP is often associated with mechanical disorders like osteoarthritis and lumbar spinal stenosis, as well as muscle and ligament injuries⁽⁸⁾.

The latissimus dorsi muscle plays a crucial role in basic back activities such as trunk extension and rotation⁽⁹⁾. Tension or stiffness in this muscle can lead to altered movement patterns and postures, exacerbating low back pain. Instrument-assisted soft tissue mobilization (IASTM)⁽¹⁰⁾ and static stretching are therapeutic interventions that have gained popularity for addressing myofascial adhesions and improving muscle flexibility, respectively⁽¹¹⁾.

The purpose of this study is to evaluate the effectiveness of myofascial release using IASTM in conjunction with static stretching exercises on pain and flexibility in individuals with latissimus dorsi tightness leading to mechanical low back pain. By addressing these specific muscular and mechanical factors, the study aims to improve functional outcomes and enhance quality of life for affected individuals.

METHODS

Study Design

This study was conducted as a quasi-experimental study to evaluate the effectiveness of myofascial release using Instrument Assisted Soft Tissue Manipulation (IASTM) combined with static stretching exercises on patients with latissimus dorsi tightness leading to mechanical low back pain.

Study Population and Location

The study population consisted of individuals experiencing low back pain due to latissimus dorsi tightness. The research was conducted at the Outpatient Department of Physiotherapy, Mahatma Gandhi Medical College and Research Institute (MGMCRI).

Study Sample Size and Duration

A total of 30 patients meeting the inclusion criteria were selected for the study. The study was carried out over a period of six months.

Sampling Technique

Participants were selected using a convenient sampling technique based on predefined inclusion and exclusion criteria.

Inclusion Criteria

- Both male and female participants
- Age range: 25 to 35 years
- Nonspecific low back pain with symptoms lasting less than 3 weeks
- Willingness to participate
- Presence of latissimus dorsi tightness and difficulty in Activities of Daily Living (ADL)

Exclusion Criteria

- History of spinal surgery
- Spinal fractures and tumors
- Lumbar radiculopathy
- Altered sensation such as paraesthesia, numbness, hyperesthesia, or anaesthesia
- Altered deep tendon reflexes
- Use of muscle relaxants

Parameters:

Visual Analogue Scale (VAS) and Quebec Back Pain Disability Scale

Procedure

Before the commencement of the study, ethical approval was obtained from the institutional ethics committee. All participants provided written informed consent after receiving a comprehensive explanation of the study's purpose and procedures.

Participants received myofascial release treatment using IASTM combined with static stretching exercises over a period of four weeks. Pre- and post-treatment assessments were conducted using the Visual Analogue Scale (VAS) and The Quebec back pain disability scale.

IASTM Technique:

Participants were positioned prone on an examination table, with the examiner applying an emollient to reduce friction. The IASTM instruments were used at a 30°-60° angle to the treatment surface, employing sweeping and fanning strokes to address soft tissue dysfunctions. Each session lasted five minutes, with four minutes for tissue warm-up and one minute focused on specific lesions. Sessions were conducted once every two days for four weeks.

Static Stretching Exercise:

Participants performed latissimus dorsi stretches in a standing position, holding each stretch for five seconds before returning to the starting position.

Statistical Analysis

Statistical analysis was performed using a paired t-test to determine the significance of changes in pain and flexibility pre- and post-intervention. The demographic data of the participants were also recorded and analysed.

Demographic Data

- **Age:** Mean of 30 years
- **Gender:** 15 males and 15 females
- **Height:** Mean of 165 cm \pm 3.5 cm
- **Weight:** Mean of 55 kg \pm 5 kg
- **BMI:** Mean of 22 \pm 3

The paired t-test results indicated a statistically significant improvement in latissimus dorsi functional ability and a reduction in mechanical low back pain, with a pre-treatment VAS score was 8 with a standard deviation of 0.651, while the post-treatment mean was 4.8 with the same standard deviation. The calculated t-value was 5.070, which exceeded the critical t-value at the 0.05 significance level (2.043). This result indicates a significant reduction in pain following the intervention.

The pre-treatment mean score of the Quebec Back Pain Disability Scale was 67 with a standard deviation of 9.79. Post-treatment, the mean score decreased significantly, as reflected by a t-value of 4.655. This t-value exceeds the critical value of 2.043 at a significance level of 0.05, indicating a statistically significant improvement in latissimus dorsi functional ability and a reduction in mechanical low back pain.

The statistically significant changes observed in both measures highlight the potential of combining Instrument Assisted Soft Tissue Manipulation (IASTM) with static stretching exercises as an effective treatment approach for this condition. These findings contribute valuable insights into the management of low back pain and support the use of targeted physiotherapy interventions to enhance patient outcomes.

RESULT & DISCUSSION:

In the present study, age group of the subjects was between 25 to 35 years of age were prone for latissimusdorsi tightness with mechanical back pain because of increase physical stress, decreased concentration on muscle flexibility during work-out etc. Aging factor plays a role to provable decrease in muscular flexibility, which sets the platform for myofibrillogenesis inducing muscular tightness. It has been reported that hamstring tightness attains as schooling starts In the present study reduction in latissimusdorsi tightness, IASTM (M2 T blade) and static stretching technique is consistent with the findings of previous studies indicating both treatment were effective in reducing pain and increasing functional ability. This has a positive effect on reduction in latissimusdorsi tightness with mechanical low back pain Mechanical low back pain is very common condition and at least 80% of the human race experience low back pain every year, waddell,1987. Back pain is a common in the second decade, disc disease and disc herniation is of repetitive low back pain, radiating to the buttock and decreased by rest. Increased by flexion, sitting, straining etc. pain is decreased by rest and in semi-fowlers position, BarrJS,et.,1952. In my present study instrument assisted soft tissue manipulation was added with static stretching among 30 subjects with latissimusdorsi tightness with mechanical low back pain. It shows statistically significant improvement 8 pre-test and 4.8 post-test in VAS. And 67 pre test and 29.6 post-test in quebec scale. This helps to improve functional ability and reduce pain in subjects with latissimusdorsi tightness leading to mechanical low back pain.

Despite the promising results, several limitations must be acknowledged. First, the study employed a convenient sampling technique, which may limit the generalizability of the findings to a broader population. Additionally, the sample size was relatively small, with only 30 participants, which may affect the robustness of the statistical analysis. The study duration was also limited to six months, and the long-term effects of the intervention remain unknown. Furthermore, the study lacked a control group, which could have provided a more rigorous comparison to better isolate the effects of the intervention. These limitations suggest that future studies should consider larger, randomized controlled trials with longer follow-up periods to validate and expand upon these findings.

The results of this study are consistent with previous research indicating that both IASTM and static stretching are effective in reducing pain and improving functional ability in individuals with muscle tightness and mechanical low back pain. For instance, studies by Waddell (1987) and others have documented the high prevalence of low back pain, particularly in younger adults, and the role of muscle flexibility in mitigating symptoms. Our findings align with these studies, reinforcing the notion that targeted interventions can have a positive impact on pain reduction and functional improvement.

Moreover, the significant improvement observed in the Quebec Back Pain Disability Scale scores is consistent with prior research that underscores the efficacy of combined therapeutic approaches. Barr et al. (1952) emphasized the importance of addressing both muscle tightness and functional limitations to achieve optimal outcomes in patients with low back pain. The integration of IASTM and static stretching in our study supports this approach, offering a comprehensive strategy to address the multifaceted nature of low back pain.

The study's findings also contribute to the growing body of evidence supporting the use of IASTM in conjunction with traditional stretching exercises. Previous studies have shown that IASTM can effectively break down myofascial adhesions, enhance blood flow, and promote healing, while static stretching helps maintain muscle flexibility and prevent re-injury. The combination of these techniques, as demonstrated in our study, provides a synergistic effect that enhances overall treatment efficacy.

In conclusion, our study highlights the potential benefits of combining IASTM with static stretching exercises to manage latissimus dorsi tightness and mechanical low back pain. While the results are encouraging, further research is needed to confirm these findings and explore their applicability to other populations and settings. Future studies should focus on larger, randomized trials with diverse participant groups to establish the generalizability and long-term benefits of these interventions.

CONCLUSION:

This study demonstrated the significant effectiveness of myofascial release using Instrument Assisted Soft Tissue Manipulation (IASTM) in conjunction with static stretching exercises in reducing pain and enhancing functional ability among individuals with latissimus dorsi tightness leading to mechanical low back pain. Thirty participants underwent a four-week intervention, with three sessions per week, and the results showed a statistically significant improvement in both pain reduction and functional outcomes. The post-test values exceeded the critical t-value at the 0.05 significance level, confirming the efficacy of the combined treatment approach. These findings underscore the potential of integrating IASTM with static stretching as a viable therapeutic strategy for managing mechanical low back pain associated with muscle tightness.

Declaration:

There is no conflict of interest

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