

COMPARATIVE EFFECTS OF INSTRUMENT ASSISTED SOFT TISSUE MOBILIZATION VS MUSCLES ENERGY TECHNIQUE ON ILIOTIBIAL BAND EXTENSIBILITY

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ABSTRACT

Background: Iliotibial band syndrome is frequently observed in healthy subjects with prolonged sitting (6 to 7 hours). Patients with the condition describe lateral knee pain brought on by activities. Diagnosis is primarily centered on a characteristic physical examination and history. ITBS occurs as a result of weak hip and gluteus muscles, loss of flexibility, excessive sitting, unbalanced leg lengths or any other inflammatory cause near lateral epicondyle. It can be primarily treated non-surgically; nevertheless, surgical intervention including release or excision of the distal part of iliotibial band is necessary in situations that are persistent or chronic.

Purpose: The aim of the study was to check the effects of instrument assisted soft tissue mobilization and muscle energy techniques on Pain, Range of Motion and Extensibility parameter among patients with Iliotibial band extensibility.

Merhodology: This randomized clinical trial study included a sample size of 26 patients with IT band syndrome. Subjects were obtained via clinical setup. After complete history, physical examination, determining the inclusion and exclusion criteria, informed consent was obtained from each subject. Subjects were divided in two groups IASTM group and METS group by purposive sampling technique by using lottery method. Pre and post treatment readings were taken from each

subject for pain using numerical pain rating scale (NPRS), extensibility of hip range of motion (adduction) , knee range of motion (flexion) using universal goniometer and functional outcome by using LEFS respectively.

Result: The findings of current study showed that within group comparison of NPRS, Hip adduction and knee flexion ROM and functional outcome with strengthening exercises shown significant effects in both groups with greater difference seen in IASTM group than METS group with p-value <0.05. Between group analysis of NPRS, Hip adduction and Knee flexion ROM and functional outcome have also shown significant results between two groups with p-value less than 0.05.

Conclusion: The study was that both IASTM and METS with strengthening exercises are effective techniques to decrease pain, improving Extensibility and functional outcome in iliotibial band syndrome patients but IASTM is better and effective technique as compared to METS.

Keywords: Iliotibial Band Syndrome, Instrument assisted soft tissue mobilization, IASTM, Muscle Energy Technique, METS.

INTRODUCTION

A common problem among athletes, especially runners, is called Iliotibial Band Syndrome (ITBS). Characterized by pain on the outside of the knee from rubbing in the iliotibial band. ITBS is when the outside part of your knee hurts and swells up (1). The iliotibial band (ITB) is the principal anatomical component associated in this condition. The ITB could be a thick band of sinewy connective tissue that begins within the pelvis and amplifies down the exterior of the thigh to the knee joint, where it joins the tibia. In order to stabilize the knee joint during a variety of lower limb movements, the iliotibial band is essential. Nonetheless, ITBS may arise as a result of ITB irritation or inflammation. Activities like jogging, cycling, and other kinds of repetitive knee flexion and extension are frequently linked to the syndrome (2). Studying the iliotibial band's anatomy is crucial to understanding ITBS completely. The ITB is a dense, thick structure made of fibers from connective tissue. It begins at the hip, where it is attached to the tensor fasciae latae muscle. It at that point amplifies down the sidelong side of the thigh, crossing the femoral condyle and finishing within the tibia. The distal part of the ITB forms a band-like structure that surrounds the lateral facet of the knee joint (3). The iliotibial band's main job is to stabilize the knee joint when doing different exercises including cycling, walking, and running. It also helps to keep the knee from moving too much to the side. Despite not being a muscle, the ITB interacts with the surrounding muscles of the hip and knee, which helps to maintain the lower limb's general biomechanics (4). The biggest muscle in the buttocks, the gluteus maximus, is also connected to

ITBS. Running and walking require stability and hip extension, which is provided by the gluteus maximus. The iliotibial band may experience greater stress as a result of altered hip joint mechanics caused by weakness or imbalance in the gluteus maximus (5). Muscle Energy Technique (MET) is a therapeutic strategy that is frequently used to alleviate musculoskeletal dysfunctions and enhance joint mobility. In order to improve muscle length, joint range of motion, and general function, MET entails the patient actively and voluntarily contracting particular muscles in a regulated manner, followed by a relaxation phase. By actively involving the patient in the therapy process, this technique is used to reduce muscle imbalances, enhance optimal neuromuscular control, and restore normal biomechanics. One of the main goals of Muscle Energy Techniques is to actively involve the patient in order to restore normal joint function and muscle length. With MET, the patient contracts particular muscles voluntarily and under control (6). With an increasing prevalence of patients with iliotibial band tightness associated with the risk factors including lifestyle changes, psychological and physical factors, there is a need to develop a treatment protocol that should be valid and can affect the extensibility of iliotibial band. The rationale of the study is to provide better treatment options for the patients of iliotibial band syndrome. Despite individual studies demonstrating the effectiveness of Instrument-Assisted Soft Tissue Mobilization (IASTM) and Muscle Energy Techniques (METs) in enhancing iliotibial band (ITB) extensibility, a

comparative analysis is lacking hence resulting significant challenges for patients. This research addresses this gap by directly comparing the outcomes of these techniques. This study helps the therapist to assess the impact of instrument assisted soft tissue mobilization and muscle energy techniques performed for enhancing the functionality of iliotibial band and aims to provide evidence-based insights into the more effective approach among patients with iliotibial band syndrome.

A huge number of writing sources are utilized to gather the writing on theme of Comparative Impacts of Instrument Helped Delicate Tissue Mobilization and Muscle Vitality Strategy on Torment, Extend of Movement and Extensibility Parameters among subjects with Iliotibial Band Disorder A expansive number of key terms for this reason which were Iliotibial Band Disorder ITB disorder, IT band, Instrument Helped Delicate Tissue Mobilization, IASTM, Muscle Vitality Procedure, METS etc. Boolean terms AND, OR and NOT were utilized (7).

Beals and others I looked at how to treat runners with iliotibial band syndrome. Ten studies looked at different ways to treat iliotibial band syndrome in athletes. They included both regular treatments and surgery. Conservative therapy has a 44% chance of completely curing the injury and allowing the person to return to sports in 8 weeks. It has a 91. 7% chance of curing the injury and allowing the person to return to sports in six months. This treatment involves resting for 2-6 weeks, doing stretches, managing pain, and changing how you run. Bursectomy is a type of treatment where the <http://xisdxjsu.asia>

damaged part of the iliotibial band is removed. It was used a lot to help with resistance therapy. Doctors found that some treatments worked better than others for iliotibial band syndrome in athletes, but more research is needed to figure out what causes it and the best way to treat it (8).

METHODOLOGY

This study took place at Allied hospital Faisalabad. National hospital Faisalabad It employed a randomized clinical trial design to assess outcomes. Non-probability purposive sampling was used to select participants, comprising both genders. A total of 24 participants met the inclusion criteria for this study. The inclusion criteria includes;

- Age ranging between 25-45 years
- Having pain (3-7 on numeric pain rating scale)
- Unilateral ITB pain for 3 months
- Male patients with Unilateral IT band pain
- Sitting for minimum 6-7 hour
- Positive Ober's test
- Willing to participate was included into study

The following criteria led to exclusion from the study:

- Participants with any auto-immune disorder
- Having co-morbidities such as neoplasm etc
- Undergone lower limb surgery in past 6 months
- Having any neurological or vascular disorders or infectious disease

- Participants with physical impairment for example paralysis or amputation of a limb
- Participants taking medication for iliotibial band syndrome

DATA COLLECTION TOOL

- NPRS
- Goniometer and Lower Extremity Functional Scale

DATA COLLECTION PROCEDURE

This randomized clinical trial study included a sample size of 26 patients with IT band syndrome. Subjects were obtained via clinical setup. After complete history, physical examination, determining the inclusion and exclusion criteria, informed consent was obtained from each subject. Subjects were divided in two groups IASTM group and METS group by purposive sampling technique by using lottery method. Pre and post treatment readings were taken from each subject for pain using numerical pain rating scale (NPRS), extensibility of hip range of motion (adduction), knee range of motion (flexion) using universal goniometer and functional outcome by using LEFS respectively. Both groups received treatment for 3 weeks, separately. Ultrasound was used as the main treatment for both groups (90). Three sessions per week was given on alternate days. the completion of three weeks post treatment readings were obtained using standardized outcome measures

DATA ANALYSIS PROCEDURE

We used a computer program called SPSS 22 to study the information. Age, which is a type of

number that can be measured, was shown as the average (mean) plus or minus the standard deviation (S.D) Categorical things like gender were shown as how often they appeared and as a percentage. We used a paired sample t-test to compare the values before and after treatment to see if there was a difference. We used the next independent t-test to compare two separate groups and see if there was a difference between them. This is the final result that was found. A p-value of 0.05 or less was considered significant, and the results were adjusted accordingly.

RESULTS

We looked at the sizes of 26 people with tightness in their iliotibial band for our study. Participants were divided into 2 groups, with 12 people in each group. This was done using a specific technique and a method of chance. One person left group A and one person left group B, so there were 24 people left out of the original 26. The results of our study are shown below, along with tables and figures that are labeled correctly. We used a test called independent sample T-test to compare the numeric pain rating scale, hip adduction and knee flexion movement, and LEFS scores between groups A and B. The results were very important with a p-value lower than 0.05 ($p=0.0001$) We used paired sample T-tests to compare the pain ratings, hip and knee flexibility, and overall function before and after treatment for both groups. In the IASTM group, the average pain score before treatment was 5.58 with a standard deviation of 0.99, and after treatment it was 2.75 with a standard deviation of 0.75 The average difference in pain score before and after treatment

was 3.50 with a standard deviation of 0.67 In the METS group, the average pain score before treatment was 5.75 with a standard deviation of 0.96, and after treatment it was 3.33 with a standard deviation of 0.98 The average difference in pain score before and after treatment was 2.41 with a standard deviation of 0.51 The results show that there is a significant difference between the two groups, with the IASTM group having larger differences. In the IASTM group, before the treatment the average (mean) hip adduction measurement was 23.85 with a standard deviation of 1.74 After the treatment, the average measurement was 31.08 with a standard deviation of 2.35 and the difference in average measurement was -7.23 In the METS group, before the treatment the average measurement was 23.96 with a standard deviation of 1.39 and after the treatment the average measurement was 28.57 with a standard deviation of 1.52 and the difference in average measurement was -4.60 The results showed a big difference between two groups (p-value <0.05), with the IASTM group showing the biggest difference. In the IASTM group, before treatment the average knee bending was 40.91 and after treatment it was 48.75 The difference between the two was -7.83 In the METS group, the average knee bending before treatment was 41.83 and after treatment it was 45.91 The difference between the two was -4.08 The results showed that there was a big difference between the two groups, with the IASTM group having the biggest difference. In the IASTM group, before treatment, the average LEFS score was 14.90 with a small amount of difference between scores. After treatment, the average score decreased to

13.53, with a mean difference of 1.36 In the METS group, the average LEFS score before treatment was 14.94, and after treatment, it decreased to 14.03, with a mean difference of 0.90 The results showed that there was a big difference between the two groups, with the IASTM group having the biggest difference.

Table 1: Age distribution

Years	Frequency	Percentage
25-29	8	33.4%
30-34	5	20.9%
35-39	4	16.8%
40-45	7	29.2%
Total	24	100%

The table shows how old the people in the study are. It splits their ages into 4 groups. Out of 24 people, 33.4% are 25-29 years old, 20.9% are 30-34 years old, 16.8% are 35-39 years old, and 29.2% are 40-45 years old. The average age of the participants was 34.79 years, with a range of 7.28

Table 4.2: BMI of Participants

Weight Categories in kg		Frequency	Percentage
Underweight	<18.5	0	0
Normal	18.5 - 24.9	8	33%

Over-weight	25-29.9	10	42%
Obese	>30	6	25%
Total		24	100%

The table 2 given above shows the BMI distribution of the study participants, the data shows that out of 24 participants, 0% were underweight, 33% participants had the normal weight, 42% participants were overweight and the rest 25% participants were obese. The mean body mass index of the participants was 26.67 ± 3.80 .

4.1: TEST OF NORMALITY

We can check if the data is normal using two tests called the Kolmogorov-Smirnov test and the Shapiro-Wilk test. If the p-value from these tests is more than 0.05, then the data is considered to be normal. The Kolmogorov-Smirnov test is good for sample sizes over 50, while the Shapiro-Wilk test is better for sample sizes under 50. The test to check if the outcome measures like pain rating, hip movement, knee movement and LEFS at the beginning are normal is written below.

4.2: Numeric Pain Rating Scale Between Group A And B Analysis

Compares the group statistics before and after a treatment using a special test called Independent T-test. The numbers show that the difference in pain scores before treatment was not important, which means the groups were similar before starting the study. The information we have indicates that there is a significant difference between the effects of two

treatments (IASTM and METS) on patients with ITB syndrome. Specifically, the IASTM technique was more effective than METS in reducing pain scores in these patients.

Discussion

A recent study compared two types of massages for people with Iliotibial Band Syndrome at two hospitals in Faisalabad. This study had two groups: Group A, which used Instrument Assisted soft tissue mobilization, and Group B, which used Muscle Energy technique. Group A got IASTM and ultrasound therapy for 10 minutes, and then did strengthening exercises for 10 minutes. Group B got extra treatment called METS, along with their regular therapy and exercises, for 10 minutes at the end of their session. Twenty-four people took part in this study. They got treatment for three weeks.

The study found that both groups saw significant improvement in pain levels, but the group that used IASTM had a bigger improvement than the group that used METS. When comparing two groups, the NPRS analysis showed important differences with a p-value below 0.05. The comparison of hip movement in two different ways showed that both had a big effect. The IASTM group had a bigger effect than the METS group. Comparing two groups, we found that there were significant differences in hip movement between the two groups with a p-value less than 0.05. The LEFS scores were compared within each group using a special test called paired sample T-test. The results showed important changes in both groups, with a bigger difference being seen in the IASTM group.

than the METS group. The p-value was less than 0.05, which means the results were statistically significant. Comparing the LEFS scores were compared within each group using a special test called paired sample T-test. The results showed important changes in both groups, with a bigger difference being seen in the IASTM group than the METS group. The p-value was less than 0.05, which means the results were statistically significant. Comparing the LEFS scores of two groups showed that there were significant differences, with a p-value of less than 0.05. The comes about of current consider have appeared that profound transverse contact rub and In patients with ITB disorder, instrument helped delicate tissue assembly strategies are exceedingly effective in decreasing persistent inconvenience, upgrading hip abd and knee flex ROM, and and extensibility with p-value 0.05. These comes about are exceedingly upheld the past inquire about wiped out 2023 by Hamna Rahman et al., which concluded that extending and the myofascial discharge of the ITB have measurably critical impacts on diminishing torment and disability in knee osteoarthritis understanding (100). Within the show ponder, discoveries concluded that IASTM strategy had noteworthy impacts in diminishing torment of the patients with ITB disorder (p-value <0.05). These discoveries are upheld by the think about done already by Humera Mubashar et al., in 2022 which concluded that IASTM strategy and extending had useful impacts in bringing down torment, improving adaptability, and improving lower limit working in patients with ITB snugness who had front knee torment with p-value <0.05.

Limitations

- Moreover, Patients might not always tell the doctor about their symptoms accurately.
- Working hours of selected.
- This study had only targeted the iliotibial band Syndrome patients

Recommendations

- Future studies should be done with greater sample size on a larger scale
- This research project can be repeated for a larger period of time to gain better results and for a trustable effect size of treatment.
- A huge number of researches done in this field will provide greater evidences based practice for future sports Physiotherapist and practitioners

Conclusion

This research found that both IASTM and METS can help reduce pain and improve movement in people with tightness in their iliotibial band. However, IASTM is a better and more effective technique compared to METS.

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