



TO COMPARE THE EFFECTIVENESS OF IASTM AND MFR WITH FOOT STRENGTH TRAINING ON PAIN THRESHOLD IN CHRONIC PLANTAR FASCIITIS

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KEYWORDS :

INTRODUCTION

Plantar fasciitis is a common cause of pain in the heel which occurs as a result of inflammation of the plantar aponeurosis at its attachment on the calcaneal tuberosity. The pain is worst early in the morning, and often improves with activity.¹ Plantar fasciitis is classified as a syndrome that results due to repetitive trauma to the plantar fascia at its origin on the calcaneum.²

The classic presentation of plantar fasciitis is pain on the sole of the foot at the inferior region of the heel. Pain is particularly bad with the first few steps taken on rising in the morning or after an extended refrain from weight-bearing activity. Often the pain diminishes after a few steps and through the course of the day, but returns if intense or prolonged weight bearing activity is carried out. Initially the heel pain may be diffuse or migratory; however, with time it usually focuses around the area of the medial tuberosity of calcaneum.³

Approximately 15% of all complaints related to foot requiring the attention of health-care professionals can be attributed to this cause. Also, it accounts for 8% of injuries in athletes involved in running-related sports. The incidence of PF is commonly found in people between the ages 40-60 years without any bias towards either sex.⁴

The primary risk factors include jobs that involve long periods of standing or walking, intense running, a sedentary lifestyle, excessive inward rolling of the foot (pes planus), high arches (pes cavus), differences in leg length, obesity, reduced flexibility of the Achilles tendon and foot muscles, and changes in heel pad thickness the persistence of these risk factors inhibits the normal repair process leading to collagen degeneration and structural changes in the plantar fascia.⁵

For patients with chronic plantar fasciitis, treatment options may include extracorporeal shock wave therapy, platelet-rich plasma injections, botulinum toxin injections, or a plantar fasciotomy.¹³ Manual therapy methods such as positional release, active release techniques, myofascial release, instrument-assisted soft tissue mobilization, and strain-counter strain techniques are commonly used to treat plantar fasciitis.¹⁴

Clinicians use various approaches to treat this condition. A potential risk is the development of an antalgic gait, as the patient may avoid putting weight on the affected foot.¹⁵ Lack of walking and avoidance of weight bearing could result in loss of muscle strength and The present study aimed to compare the effectiveness of IASTM Instrument Assisted Soft Tissue Manipulation and Myo fascial release (MFR) in reducing the pain and improving the muscle strength in plantar fasciitis subjects. Both interventions have shown statistically significant enhancements in reducing the pain and improving the muscle strength, as evaluated by Pressure algometer and Toe dynamometer.

Objectives of the Study

- To find out the effectiveness of Instrument Assisted Soft Tissue Manipulation to reduce the pain and improve foot strength in plantar fasciitis.
- To find out the effectiveness of Myo fascial release to reduce the pain and improve foot strength in plantar fasciitis.
- To Compare the effectiveness of Instrument Assisted Soft Tissue Manipulation, Myo fascial release to reduce the pain and improve foot strength in plantar fasciitis.

METHODOLOGY

- **Study Design** - Pre – post comparative study
 - **Study Subject** – Patient with Plantar Fasciitis
 - **Sample Size**: 38
- The formula used $N = 2 * [(Z(1 - \alpha/2) + Z(1 - \beta))]^2 * \sigma^2 / d^2$ The estimated sample size is 19 in each group.
- **Sampling Method**: Convenience Sampling
 - **Study Setting and Source of Data**: Florence College of physiotherapy OPD
 - **Study Duration**: 4 – 6 months

Inclusion Criteria

- Age between 18 to 45 years
- Subjects of both genders
- Plantar fasciitis patients with hamstring and calf tightness
- Pain score of ≥ 4 on the Visual Analog Scale (VAS).

Exclusion Criteria

- Patients who had any clinical disorder (infective condition of foot/ankle), where myofascial release is contraindicated.
- Diagnosis of tumor, fracture and severe osteoporosis chances.
- Patients who have any surgery of knee and ankle

Methods of Data Collection

Ethical clearance was obtained from the ethical committee of Florence college of physiotherapy (Annexure - II)

Patients were enrolled and divided into two experimental groups. Group A and Group B
Group A (n = 19); Group B (n = 19)

Each training protocol involved 20 Sessions (40 mins / day, 5 times/week for 4 weeks)

Procedure

Group A the experimental group received Instrument assisted soft tissue manipulation with Participants in the Group A were asked to be in prone lying position while the therapist will be facing towards the foot end of the patient, all the required materials like emollient, the tools IASTM 4 and IASTM 6 tools, cotton swabs the materials going to be used should be checked and the tools should be sterilized before every use.

Group B Eccentric Strength Training Program

The eccentric training program was based on different kinds of exercises. More precisely, the subjects will perform eccentric contraction of the plantar flexor muscles with the leg fully

extended as described in Alfredson et al ; The intensity level was increased by an elevated number of exercises (i.e., the number of eccentric plantar flexion per exercise) and the jump height. The training program lasted for 4 weeks

Statistical Analysis

SPSS version 23.0 was used to analyze the data that was gathered. While categorical variables were represented as frequencies and percentages, continuous variables were summarized using descriptive statistics such as mean and standard deviation. Paired sample t-test was used to examine at within-group differences (for example, pre- and post-intervention scores in the IASTM and MFR groups).

Table- 1 Comparison of Pressure Algometer Score within Group - A and Group - B Between Pre-test and Post Test

Groups	Pre Test		Post Test		t - test	Significance
	Mean	S.D	Mean	S.D		
Group- A	168.42	22.36	372.89	18.58	-39.98	.001**
Group- B	170.26	38.02	299.73	18.59	-12.12	.001**

The above table reveals the Mean, Standard Deviation (S.D), t-value and p-value between pre-test and post-test within Group - A & Group - B. There is a statistically significant difference between the pretest and posttest values within Group A and Group B at $P \leq 0.05$.

Table- 2 Comparison of TOE Dynamometer Strength Score Within Group - A and Group - B Between Pre-test and Post Test

Groups	Pre Test		Post Test		t - test	Significance
	Mean	S.D	Mean	S.D		
Group- A	80.21	9.13	150.78	16.60	-20.28	.001**
Group- B	81.15	9.19	93.57	11.30	-5.90	.001**

(** - $P \leq 0.05$ - Significant).

The above table reveals the Mean, Standard Deviation (S.D), t-value and p-value between pre-test and post-test within Group - A & Group - B. There is a statistically significant difference between the pretest and posttest values within Group A and Group B at $P \leq 0.05$.

On comparing the Mean Values of Group A & Group B on Pressure Algometer Score, it shows significant increase in the post test mean values in both groups, but (Group A) shows 372.89 ± 18.58 which has the higher mean value is more effective than (Group B) 299.73 ± 18.59 at $P \leq 0.05$. Hence the null hypothesis is rejected.

On comparing the Mean Values of Group A & Group B on Toe Strength using dynamometer Score, it shows a significant increase in the post test mean values in both groups, but (Group A) shows 150.78 ± 16.60 which has the higher mean value is more effective than (Group B) 93.57 ± 11.30 at $P \leq 0.05$. Hence the null hypothesis is rejected.

On comparing Pretest and Posttest within Group A & Group B on Pressure Algometer score & Toe Strength using dynamometer Score shows significant difference in the mean values at $P \leq 0.05$.

DISCUSSION

This study aimed to compare the effectiveness of Instrument Assisted Soft Tissue Mobilization (IASTM) and Myo fascial release (MFR) in improving muscle strength and reducing pain in plantar fasciitis in individuals with plantar fasciitis. The statistical analyses indicated that both therapies considerably improved muscle function and reduced pain; however, IASTM had somewhat superior results regarding muscle function, as shown by the Toe Dynamometer (TD) often respond well to conservative treatments like rest, stretching, orthotics, and activity modification.

The current findings indicate that whereas IASTM effectively activates muscles of the sole of the foot and improves the muscle strength, MFR may have a more pronounced effect on reducing pain and improving muscle strength. This dichotomy corresponds with an increasing agreement in rehabilitation research that no one approach is generally optimal; rather, manipulation must be tailored to individual patient objectives, deficiencies, and clinical characteristics.

However, IASTM may offer a modest advantage in improving the muscle function and reducing the pain, making it a potentially more comprehensive therapeutic option in certain cases. Clinicians may consider integrating either or both approaches based on patient needs, therapy goals, and functional limitations. Future research with larger samples and long-term follow-up is recommended to further validate these findings and guide evidence-based clinical decision-making.

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