



## EFFECT OF MYOFASCIAL TRIGGER POINT RELEASE ON PAIN AND FUNCTIONAL ABILITY IN PATIENTS WITH PLANTAR FASCIITIS.

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### ABSTRACT

**Background:** Several previous studies have reported that stretching of hamstring and plantar fascia are effective management strategies for plantar fasciitis (PF). However, the effectiveness of soft tissue therapy on functional outcomes in this population is not well documented. **Objective:** To find out the effects of combining conventional exercises with Myofascial trigger point (MTrP) release on pain and improving functional abilities in patients with Plantar fasciitis. **Study Design:** Experimental design **Source of Data Collection:** DAV institute of physiotherapy, Yamunanagar. **Methodology:** 30 Subjects with PF were included in study on the basis of inclusion criteria were randomly allocated into 2 groups: Group A received MTrP release therapy for TrP of gastrocnemius muscle, soleus muscles and plantar fascia along with conventional treatment of PF and Group B received only Conventional treatment. Treatment was given for 5 consecutive days. Pain & functional ability was measured as Outcome measure on 1st and 5th day using Visual Analogue Scale and Foot & Ankle Ability Measure (FAAM) scale. **Result:** Statistically significant improvement ( $p < 0.05$ ) noticed in both groups for all the outcomes. However in between comparison showed that combining MTrP release therapy to conventional treatment improved the pain and functional ability of patients with PF more than the conventional treatment alone. **Conclusion:** This study provides evidence that the addition of MTrP release therapy to conventional treatment protocol resulted in superior outcomes in the treatment of PF.

**KEYWORDS :** Myofascial trigger point release, Foot & Ankle ability measure scale, Plantar fasciitis.

### INTRODUCTION

Plantar fasciitis is used to describe a painful heel with inflammation of the plantar fascia at its origin caused by repetitive stress.<sup>1</sup> PF is the most common foot pain condition treated by healthcare providers.<sup>2</sup> It is more common in women and affects up to 10% of general population, accounting for 11 to 15% of all foot pathologies.<sup>3</sup> Patients with PF usually report insidious sharp pain under the heel, along the medial border of foot, upon weight bearing after a period of non-weight bearing.<sup>4</sup> Pain is worse in morning, with first steps after getting out of bed and after prolonged periods of inactivity. In some patients, these symptoms can induce considerable functional limitations and prolonged disability.<sup>5</sup>

Aetiology of PF is multifactorial. Tension placed on plantar fascia increases due to anatomical factors such as abnormal foot posture, tight/weak posterior calf musculature. In addition, environmental factors such as unaccustomed walking or running, change in walking or running surface, occupations involving prolonged WB or shoes with poor cushioning. These factors introduce the fascia to an unusual or increased amount of stress which in turn leads to overloading of plantar fascia.<sup>6</sup>

Three most commonly used diagnostic criteria for PF are pain on palpation of medial plantar heel, early morning pain and pain on plantar fascia stretch.<sup>7</sup> Less frequently imaging investigations used for its diagnosis shows heel spurs on x-ray and thickened plantar fascia on ultrasound.<sup>8</sup>

Physical therapy plays a key role in managing the condition with different techniques like electrotherapy, manual therapy and with some exercises. Different manual techniques like active and passive joint mobilization, stretching of gastrocnemius muscle has shown moderate evidence of effectiveness in the management of PF, although only in the short term.<sup>9</sup>

Simons et al suggested that MTrPs in the gastrocnemius muscles may be involved in the development of plantar heel pain. TrPs are defined as hyperirritable areas associated within a taut band of skeletal muscle that are painful on compression, contraction, or stretching of muscles, and elicit a referred pain distant to the TrP.<sup>10</sup> A recent study has also found that the stiffness of TrP taut bands was 50% greater than the

surrounding muscle tissues.<sup>11</sup> It is probable that the increased stiffness induced by taut bands with TrPs may reduce the effectiveness of conventional treatment such as muscle stretching used for the management of PF.

Therefore, it is hypothesized that MTrP release would further improve the effectiveness of conventional treatment in the management of PF. Due to scarce of literature related to its effectiveness on PF and lack of evidences present, the aim of this study was to compare the effect of combined conventional and MTrP release therapy to conventional therapy alone in patients with plantar fasciitis.

### METHODS

#### Participants

Study design was Experimental and sampling technique was non-randomized convenient sampling technique. Total 30 subjects with PF were included in the study on the basis of inclusion criteria and were randomly allocated into 2 groups as Group A and B using computer software program that generates random sequence.

#### Inclusion Criteria

- Age 30-55 years
- Both male and females
- VAS score between 3-7
- Clinically diagnosed cases of plantar fasciitis by orthopedician
- Patients having Windlass test positive

#### Exclusion Criteria

- Calcaneal spur.
- Previous foot injuries or surgery.
- Neurological disorder like spastic foot.
- Generalized inflammatory disorders including RA, AS, Reiter's disease, gout or lupus.

#### Outcome Measures

VAS and FAAM questionnaire was used to evaluate pain & functional ability of foot and ankle respectively on 1<sup>st</sup> and 5<sup>th</sup> day.

#### Study Protocol

Subjects in Group A received both MTrP release therapy and conventional therapy of PF and Group B received only

conventional treatment.

Treatment was given for 5 consecutive days.

**GROUP A:**

**1. Conventional Treatment<sup>12</sup>.**

·**Ultra sound Therapy:** Applied over medial calcaneal tubercle. Dosage Frequency 3 MHz, Intensity 1.5 w/cm<sup>2</sup>. Duty cycle: 20% for 5 minutes.

**Stretching And Strengthening Protocol:**

oStretching of soleus, gastrocnemius muscles and plantar fascia. 3 sets of 2 repetitions with 30 seconds hold.

Strengthening exercises for intrinsic muscles of foot.

**Cryotherapy:** Applied over medial calcaneal for 15 minutes.

**2. MTrP Release Therapy For TrP Of Gastrocnemius, Soleus And Plantar Fascia.<sup>13</sup>**

Position of Patient: Prone lying and foot off the table.

Position of Therapist: Therapist at end of table facing towards the patient.

Each session time was of 5 minutes with 2 repetitions.

**Technique of Gastrocnemius TrP Release:** Therapist's Elbow with 90° flexion used by taking up a contact with the insertion of gastrocnemius at tendocalcaneus into mid-posterior calcaneus and provides the tension in cranial direction.

**Technique of Soleus TrP Release:** Therapist's Elbow with 90° flexion taking up a contact with the insertion of soleus at tendocalcaneus and provides the tension in cranial direction.

**Technique of Plantar Fascia TrP Release:** Knuckles of the hand used to release the fascia from head of calcaneus to downward direction.

**Group B** received only conventional treatment as described above.

**RESULT**

**Comparison of VAS between Group A and B**

Unpaired T Test	VAS			
	1 <sup>st</sup> Day		5 <sup>th</sup> Day	
	Group A	Group B	Group A	Group B
Mean	4.27	5.00	1.67	3.27
S.D.	2.963	2.752	1.988	2.404
Mean Difference	0.73		1.60	
Unpaired T Test	0.702		1.986	
P value	0.4883		0.0569	
Table Value at 0.05	2.05		2.05	
Result	Not-Significant		Not-Significant	

**Comparison of FAAM Between Group A And B.**

Unpaired T Test	FAAM			
	1 <sup>st</sup> Day		5 <sup>th</sup> Day	
	Group A	Group B	Group A	Group B
Mean	55.15	43.88	72.54	52.22
S.D.	16.512	13.951	13.828	14.621
Mean Difference	11.27		20.33	
Unpaired T Test	2.020		3.912	
P value	0.0531		0.0005	
Table Value at 0.05	2.05		2.05	
Result	Not-Significant		Significant	

**DISCUSSION**

Result of current study suggests that addition of MTrP release to conventional therapy results in better outcomes in treatment of PF.

The underlying mechanisms behind the effectiveness of MTrP release in the management of PF are not fully understood and both mechanical and neurophysiological mechanisms have been proposed. Both therapeutic mechanisms target the motor and sensitive component of the TrP based on the integrated hypothesis.

**Improvement in Pain:**

From neurophysiological point of view, it has been stated that acute or chronic muscle overload initiates the excessive release of acetylcholine, which produces the local energy crisis that can account for the clinical characteristics of MTrP.<sup>14</sup> Increased blood flow to the trigger point induced by MTrP Release therapy may breaks the local energy crisis and resolve the trigger point. It has been proposed that Direct pressure on sarcomeres in MTrP release produces relaxation of involved muscle, may equalize or increase the length of the sarcomeres which can increasing ROM and reduce muscle tension and consequently decrease the pain and tenderness.<sup>15</sup> More reduction in tension of taut band in calf muscle may cause more reduction in excessive tensile loads over the plantar fascia.

MTrP release also produces reactive hyperaemia within the TrP and relief of muscle tension by a spinal reflex mechanism, produce improvement in pressure tolerance at MTrP.<sup>16</sup>

Mc Partland JM et al stated that osteopathic manipulative treatment such as MET, TrP release etc. releases endogenous cannabinoids which binds to receptors in brain and produces reduction in pain perception.<sup>17</sup> Analgesics effect of MTrP release can also be attributable to the stimulation of afferent pathways and excitation of afferent A-delta fibres, which causes segmental pain modulation as well as modulation through the activation of descending pain inhibiting systems.

**Improvement In Functional Ability:**

From mechanical point of view, it has been suggested that taut bands with trigger points have greater stiffness than the surrounding tissues. MTrP in calf muscle can leads to reduce or limited dorsiflexion of ankle joint, which can further increase the risk of plantar fasciitis.<sup>16</sup> MTrP release increases the effectiveness of stretching by decreasing muscle stiffness. This was further established that compression over MTrP of calf muscle by direct pressure combined with stretching of involved muscle may normalize the length of sarcomeres and reduces the excessive stress force over plantar fascia.<sup>18</sup>

In chronic stage, fibrotic changes occurs in plantar fascia and stretching of plantar fascia might have increased its elasticity. Collectively MTrP release therapy and stretching program might reduce the tightness of calf muscle and produce relaxation of contracted muscle fibres at TrP.

**CONCLUSION:**

Study concluded that MTrP release along with conventional therapy is more effective than conventional therapy alone and resulting in speedy and early recovery in patient with plantar fasciitis.

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