

To find the effectiveness of myofascial release therapy and ultrasound in plantar fasciitis

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Abstract

Plantar fascia is also known as plantar aponeurosis. It is triangular in shape, the centre part is thick and thinner at either sides. They are present directly beneath under the skin of sole of foot. The main cause for pathology are Excessive wear to plantar fascia of foot and Biomechanical fault that cause abnormal pronation of foot. The important features resulting from pathology are gradual and insidious onset of heel pain in plantar fascia, Early morning stiffness is more common. Pain worsens with ambulation and may exacerbate by climbing stairs. This condition can be treated with wide variety of methods like, Stretching exercise to plantar fascia, soleus and gastrocnemius. Tapping around ankle joint. Ankle foot orthotic device. But there is growing body of literature in myofascial release technique which is effective in various soft tissues lesions. It is a class of manipulative technique that relieves abnormal constriction of fascia. Similarly therapeutic ultrasound is one of the most commonly used modality in management of soft tissue lesion. Studies with comparison between therapeutic ultrasound and myofascial release therapy is lacking. Hence the study was undertaken with intention to find out effectiveness of therapeutic ultrasound and myofascial release technique.

Keywords: Plantar fasciitis, Myofascial release, Ultrasound

1. Introduction

Plantar fascia is also known as plantar aponeurosis. It is triangular in shape, the centre part is thick and thinner at either sides. They are present directly beneath under the skin of sole of foot. It is important static support for the longitudinal arch of foot. As load increases, it elongates to act as a shock absorber. But its elongation is limited. Protect the deeper structures. Plantar fasciitis is painful inflammatory condition with involvement of plantar fascia. It was also known as, “Jogger’s heel, heel spur syndrome, and periostitis”. In 80% of cases it is unilateral, in 20% of cases it is seen bilateral. Commonly believed aetiology can be Excessive wear to plantar fascia of foot. Biomechanical fault that cause abnormal pronation of foot. Commonly seen in sports that involve running, tennis and basketball players. The presentation is with gradual and insidious onset of heel pain in plantar fascia. Early morning stiffness is more common. Pain worsens with ambulation and may exacerbate by climbing stairs. Focal tenderness is seen on sole of foot inner aspect of heel bone. Numbness is also present over heel. Patients complain of pain at initial steps from bed, and become normal as they walks.

There is growing body of literature in myofascial release technique which is effective in various soft tissues lesions. It is a class of manipulative technique that relieves abnormal constriction of fascia.

Similarly therapeutic ultrasound is one of the most commonly used modality in management of soft tissue lesion. Here electrical energy is converted into acoustic energy.

2. Methodology:

Based on the selection criteria two groups were formed.

Inclusion criteria: Age between 25 to 40 years, Both male and female, Unilateral (either right or left plantar fascia involvement.) Acute pain onset.

Exclusion criteria: Calcaneal apophysitis, Retro-calcaneal bursitis., Presence of any Tumor, Fracture in and around ankle and foot, Presence of any Metal implant in lower limb (ankle and foot).

Diagnoses of calcaneal spur, Dermatitis, Impaired circulation in lower limb, Neurological deficit, Uncontrolled diabetes mellitus, Subject who receive corticosteroid injection in heel preceding 3 months of duration, Individual with pesplanus.

Based on this two groups Group A (control group) and Group B(experimental group) were identified with 12 members in each group.

ULTRASOUND THERAPY: It is a high frequency sound waves works on principle of reverse peizo electric effect which can be used to treat deep tissue injuries by stimulating blood circulation and cell activity. Subjects in this group A were treated with pulsed ultrasound having the intensity of **1 w/cm²**, frequency of **1 MHz for 7 minutes** (Fig 1) along with home exercise. The patient is made to lie down in prone ankle supported over folded towel. The gel is applied over the head of transducer and applied over the area around the heel. This can also be done by patient sitting with crossed leg.



Fig 1

MYOFASCIAL RELEASE THERAPY: It is a soft tissue mobilization technique. It involves applying pressure to the trigger point and increasing pressure so that the point release and softens. After the release of the point the muscle must be moved to its full range.

Subjects In group B receive myofascial release along with therapeutic ultrasound and home exercise.

The patient in long sitting, the therapist at the foot end of couch. The therapist uses a closed fist to contact the sole of foot just proximal to metatarsal heads. Before applying pressure the therapist should

check the position of foot into dorsiflexion and toe in extension. Then the therapist drags the fist over plantar fascia in circular motion and apply pressure over restricted area and throughout the fascia(Fig 2) . This can also be done with patient supine lying and high sitting with crossed legs.



Fig 2

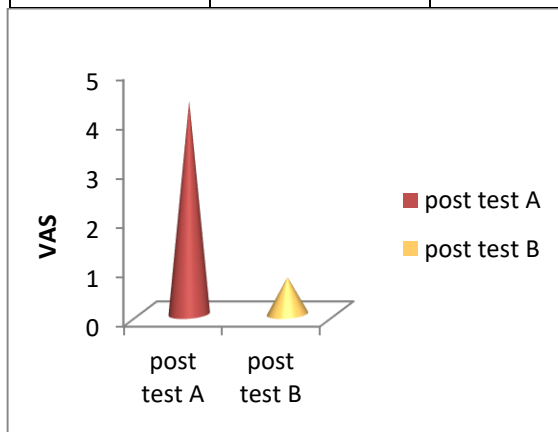
Home Exercise for Plantar Fasciitis:

- * Stretch the arch of foot in bed before getting out of bed in morning.
- * Do runners stretch to stretch back of calves and arch of foot.
- * Stretching to : Gastrocnemius, Soleus, Plantar fascia

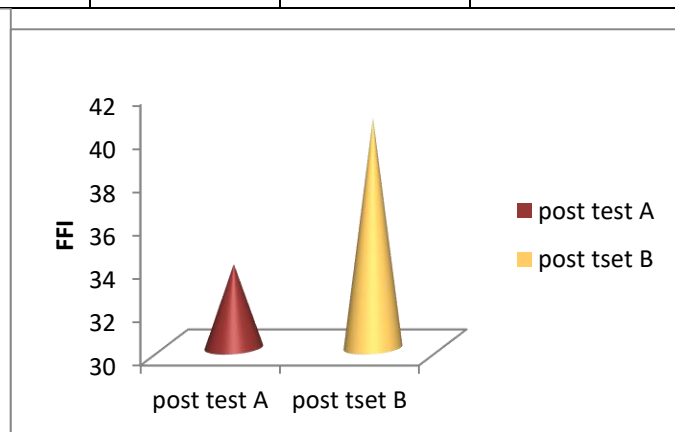
Data Analysis

Comparisons of Post Mean Value of Group A And B For Vas And FFI

	Post mean of group A	Post mean of group B	SD	't' value	Table 't' value
VAS	4.33	0.75	1.17	8.23	2.107
FFI	33.86	40.6	2.81	2.44	



Graph:1



Graph: 2

3. Discussion

Twenty four patient who had acute unilateral plantar fasciitis for at least 1 month had participated in this study. They were randomized into two groups and were evaluated before and after 14 days of treatment. All patients completed the study. In Group A patients treated with therapeutic ultrasound, stretching

exercise (gastrocnemius, soleus, plantar fascia) and strengthening of ankle joint, 4 of 12 patients were recovered completely. The remaining 8 of 12 patients showed pain reduction out of which 2 patients failed to respond to home program. In Group B patients were treated with myofascial release therapy, therapeutic ultrasound, stretching (gastrocnemius, soleus, plantar fascia) and strengthening exercise of ankle joint. 6 of 12 patients were recovered completely. The remaining 6 of 12 patients showed significant reduction in pain, out of which 2 patients complain about very minimal pain (VAS score 1). The improvement of the patient can be assessed with functional foot index questionnaire to mark the level of pain, activity limitation and disability.

Based on the statistical analysis performed between both the groups, post mean of VAS score for Group A and Group B was 4.33 and 0.75 respectively. And post mean of FFI was 33.86 and 40.6 respectively. Even though the VAS score of Group B is less when compared to Group A there is significant pain reduction. The author stated that there was no improvement in treating plantar fasciitis patient with ultrasound. **Reneta Gracielle Zanon et al;** had conducted a study on 22 individuals and showed there is no improvement in ultrasound therapy.

Standard deviation of both VAS and FFI was 1.17 and 2.81 respectively. The “t” value for independent “t” test calculated between VAS and FFI are 8.23 and 5.85 respectively with 24 degrees of freedom. Both are significant at level 0.05%. Based on statistical analysis from the data collected have shown significant improvement in Group B with unilateral heel pain when compared with the Group A.

This is because as the Group B patients receiving the myofascial release therapy involves following effects. The myofascial release therapy will stimulate four mechanoreceptors of fascial matrix (Pacini, Golgi, Ruffini & Interstitial), through the touch and kinesthetic awareness. The applied pressure sensitive technique and sustained pressure release the restricted fascia. Myofascial release hands-on manipulation could influence intracellular biochemistry and enhance cytokine secretions to give the improved range of motions and pain reduction that is seen post-treatment. Another beneficial is reduction in strength of cross-links between the collagen fibers and adhesion, leading to improved ability of fascial layer to slide over each other. The technique performed for five minutes will influence entire fascial network, it is believed that the time taken for the fibers to rearrange is 90 – 120 seconds.

4. Conclusion

Based on statistical analysis from the data collected have shown significant difference in group B with unilateral heel pain when compared with the group A.

Hence the null hypothesis is rejected and the alternate hypothesis of this study is accepted and could be stated that There is significant difference in effect of myofascial release therapy combined with conventional exercise in reduction of pain and increase functional status than ultrasound combined with conventional exercise.

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