



ORIGINAL RESEARCH PAPER

Physiotherapy

THE EFFECTS OF SELF STRETCHING AND MYOFASCIAL TRIGGER POINT RELEASE FOR PLANTAR FASCIITIS

KEY WORDS: Self Stretching, Myofascial Trigger Point Release, Cryotherapy

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ABSTRACT

The plantar fascia is a thickened fibrous Apo neurosis that originates from the medial tubercle of the calcaneus, runs forward to insert into the deep, short transverse ligaments of the metatarsal heads, dividing into 5 digital bands at the metatarsophalangeal joints and continuing forward to form the fibrous flexor sheathes on the plantar aspect of the toes. Plantar fasciitis is a chronic degenerative process involving the plantar Apo neurosis of the foot, most commonly at its insertion into the medial tubercle of the calcaneus. Plantar fasciitis occur as a result of repetitive traction forces on the plantar fascia at its origin over the distal calcaneus. It accounts for 8-10% of running related injuries and 80% of heel pain and is commonly seen in primary care. During heel-off phase of gait, tension increases on the plantar fascia and during toe-off the plantar fascia passively contracts, converting the potential energy. Patients with plantar heel pain usually report insidious pain under the heel, along the medial border of the plantar fascia to its insertion at the medial tuberosity of the calcaneus, up on weight bearing after a period of non-weight bearing. Physical therapy intervention applied to overcome heel pain but, recent studies shown soft tissue manipulation is more effective in reducing pain. Myofascial trigger points (MTrs) are unbelievably common yet commonly overlooked or poorly treated because the initial training of few medical practitioners. 30 individuals with the age group of 30-50 years, irrespective to the gender. Self stretching with cryotherapy were given to the experimental group and myofascial trigger point release with cryotherapy were given to the control group.

RESULT: The result stated that statistical significance increase in the group which received Myofascial trigger point release with cryotherapy as compare to the group which received self stretching with cryotherapy. Where the significant difference with $p < 0.0001$ in Group A as well as Group B.

INTRODUCTION:

Plantar Fasciitis is one of the most common overuse injury treated by health care providers [1]. Plantar Fasciitis is the pain and inflammation at the point where the thin band of tissues called the plantar fascia connects the heel to toes. This tissue helps to support the bones of arch and absorbs some of the strain which we put on our feet whether from running or other kinds of vigorous exercise. It affects both sedentary and athletic people and is thought to result from chronic overload either from life style or exercise. Current literature suggests that plantar fasciitis is more correctly termed fasciosis because of the chronicity of the disease and the evidence of degeneration rather than inflammation and lies superficial to the muscle of the plantar surface of the foot [2].

The plantar fascia is a thickened fibrous aponeurosis that originates from the medial tubercle of the calcaneus, runs forward to insert into the deep, short transverse ligaments of the metatarsal heads, dividing into 5 digital bands at the metatarsophalangeal joints and continuing forward to form the fibrous flexor sheathes on the plantar aspect of the toes. Small plantar nerves are invested in and around the plantar fascia, acting to register and mediate pain. The plantar fascia is made up of 3 distinct parts: the medial, central, and lateral bands. The central plantar fascia is the thickest and strongest section, and this segment is also the most likely to be involved with plantar fasciitis [3]. The medial portion of the plantar Apo neurosis is thin and continuous medially with the dorsal fascia and laterally with the central portion of the plantar aponeurosis. Edema in the plantar fascia therefore affects movement in the foot by inhibiting normal tendon movement to flex and extend the foot especially when body weight is applied [5]. In normal circumstances, the plantar fascia acts like a windlass mechanism to provide tension and support through the arch. It functions as a tension bridge in the foot, providing both static support and dynamic shock absorption [3].

Plantar fasciitis is a chronic degenerative process involving the plantar aponeurosis of the foot, most commonly at its insertion into the medial tubercle of the calcaneus [4]. Plantar Fasciitis occurs as a result of repetitive traction forces on the plantar fascia at its origin over the distal calcaneus. It accounts for 8-10% of running related injuries and 80% of heel pain and is commonly seen in primary care [1]. It is most common in people who exercise frequently or especially in people with high BMI or the elderly [5].

result in a diagnosis of plantar fasciitis [4]. Resolution of the symptoms occurs in the majority of patients within ten months [6]. Most patients initially seek care from their primary care physician. The peak of incidence of plantar fasciitis occurs in persons aged between 45 and 64 years, and it is more common in women. Individuals with pes planus (flat foot) and pes cavus (high arch) deformity are at increased risk of developing plantar fasciitis, as are individuals who wear poorly supporting footwear and who undertake excessive walking or weight bearing activity, [1] individuals with shortened Achilles tendon, over pronation (inward roll), limited ankle dorsiflexion, weak intrinsic muscle of the foot, weak plantar flexor muscles, previous heel pain and a high body mass index are also risk factor for plantar fasciitis.

During running, the vertical forces in the foot at foot strike may reach 2-3 times an individual's body weight. The plantar fascia and the longitudinal arch are also part of the foot's shock absorption mechanism. During the heel-off phase of gait, tension increases on the plantar fascia, which act as a storage of potential energy. During toe off, the plantar fascia passively contracts, converting the potential energy into kinetic energy and imparting greater foot acceleration [3].

Patients with plantar heel pain usually report insidious sharp pain under the heel, along the medial border of the plantar fascia to its insertion at the medial tuberosity of the calcaneus, up on weight bearing after a period of non-weight bearing. The pain is worse in the morning with the first steps after getting out of bed, after prolonged periods of inactivity (eg: sitting) or at a beginning of a workout. The pain typically lessens with increasing activity (eg: walking, running) but tends to worsen toward the end of the day. In some patient's these symptoms can induce considerable functional limitations and prolonged disability [7].

AIM OF THE STUDY:

The aim of the study is to compare the effect of myofascial trigger point release and self-stretching in patients with plantar fasciitis.

OBJECTIVE OF THE STUDY:

- To study the effect of self stretching with cryotherapy on decreasing heel pain and to improve functional ability.
- To study the effect of myofascial trigger point release with cryotherapy on decreasing heel pain to improve flexibility and functional ability.

Each year approximately 1 million office-based physician visits

NEED OF STUDY:

Need of study is to find the effect of self stretching and myofascial trigger point release for plantar fasciitis, to find which one have better result in decreasing the heel pain and improving function.

BACKGROUND:

Plantar Fasciitis is a common condition and can occur as a single occurrence or repeatedly. Several physical therapy intervention applied to overcome heel pain but, recent studies shown soft tissue manipulation is more effective in reducing pain.

Myofascial trigger points (MTrs) are unbelievably common yet commonly overlooked or poorly treated because the initial training of few medical practitioners includes adequate instruction in the identification and treatment of MTrs.

In previous study Simons et al have suggested that taut bands myofascial / muscle trigger points (TrPs) in the gastrocnemius muscles may be involved in the development of plantar heel pain. This study will examine the effect of self stretching with cryotherapy and myofascial trigger point release with cryotherapy in patient with plantar fasciitis.

MATERIALS AND METHODS

Study Design : Experimental study
 Study Type : Comparative study
 Study Sample : 30
 Study Duration : 1 month

INCLUSION CRITERIA:

- Ages between 30-50 years
- Both gender included
- Patients with VAS(visual analogue scale)score more than 4

EXCLUSION CRITERIA:

- Previous fracture or surgery of the foot
- Plantar fasciitis along with associated disorder like ankle sprain
- Patients with connective tissue disorder associated with or contributing to the diagnosis of plantar fasciitis (eg : RA, gout, lupus)
- Calcaneal epiphysitics
- Calcaneal stress fracture
- Fat-pad atrophy
- Heel contusion
- Inflammatory arthropathies
- Neuropathic pain

OUTCOME MEASURE:

- VISUAL ANALOG SCALE (VAS)
- FOOT FUNCTION INDEX (FFI)

PROCEDURE:

Individuals fulfilled inclusion criteria were taken as subjects. Treatment techniques were clearly explained to the subjects for their participation. 30 participants are selected who has been diagnosed as plantar fasciitis with VISUAL ANOLOG SCALE (VAS) score 4/10 were taken as subjects in this study and the participants are divided in to two groups A and B.

Group A: Self stretching with cryotherapy
 Group B: Myofascial trigger point release with cryotherapy

Group A:

Self stretching exercises were given for 30 seconds.

Calf and arch stretch using a towel .Keep the towel near the bedside and performing before going to sleep and before taking first steps in the morning .Pull back on foot for 30seconds 3 times with 30 seconds of rest in between.

Wall push: With the heel on the ground and ball of foot on the base of a wall, the patient leans in to the wall to stretch the plantar fascia for at least 2 minutes at 10 seconds intervals on the affected side atleast 2 times daily.

Plantar fascia stretching: The patient crossed the affected leg over the contralateral leg. While placing the fingers of same side of hands across the base of the toes, the patient pulled the toes back toward the shin until he/she felt a stretch in the arch or plantar fascia.

Group B:

Myofascial trigger point release technique were given on gastrocnemius muscles for 90 seconds.

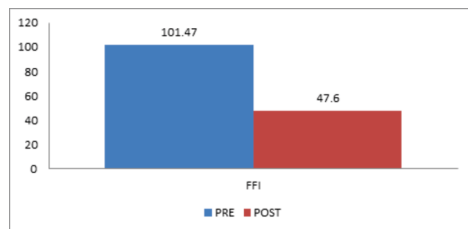
Subjects were examined and noted active trigger point on the medial aspect of gastrocnemius muscle where trigger point pressure release technique applied to the patient. The pressure was maintained until the therapist perceived release of the taut band holding it to 90 seconds and repeated 3 times.

Myofascial release technique lifting or rolling technique on gastrocnemius muscle belly and stretch strokes application done at Achilles tendon.

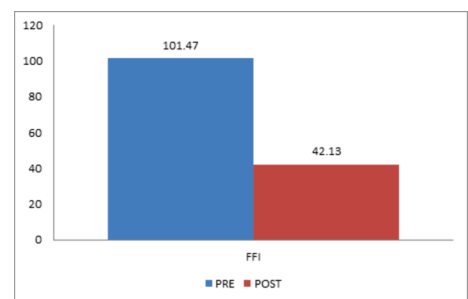
Cryotherapy is also given along with all the techniques in Group A as well as Group B. Cryotherapy is given by application of icepack by wrapping dry or moist towelling bed time at night.Ice pack is given for a duration of 20-25 minutes.

DATA ANALYSIS:

BAR Graph showing group A pre &post values FOOT FUNCTION INDEX



BAR Graph showing group B pre &post values FOOT FUNCTION INDEX



RESULT:

There is a significant difference with p value < 0.0001 in Group A and Group B. There is a slight improvement in the reduction of pain in Group B when compared to Group A. After the intervention the result showed an improvement in reducing pain in both groups. The mean difference in pre post values for Group A are 101.47±47.60, 5.53±2.07 for FFI and VAS respectively and in Group B are 101.47± 42.13, 5.27±1.07 for FFI and VAS respectively.

Table 1 shows that there were significant difference in the treatment (self stretching exercises with cryotherapy) and for the outcome measure VAS and FFI were tested by using unpaired t test and were found statistically significant at p <0.0001. Table 2 shows that there were significant difference in treatment (myofascial trigger point release with cryotherapy) and for the outcome measure VAS and FFI were tested by using unpaired t test and were found statistically significant at p <0.0001.

DISCUSSION:

Plantar fasciitis is a common pathological condition in the

adult, affecting the hindfoot, and can often be a challenge for clinicians to treat successfully. Although the majority of patients with plantar fasciitis have resolution of the symptoms within ten months, approximately 10% have development of persistent and often disabling symptoms.

This evaluation criteria were chosen to target specifically the effects of the protocol on pain and overall daily function as well as patient satisfaction and also chose to evaluate measures with a questionnaire that generated feedback with regard to the patients' perceptions of the outcome measures which provide an additional measurement tool that concentrated on function and satisfaction and supplemented the pain subscale of the Foot Function Index. The pain subscale of the Foot Function Index was chosen because it is a validated instrument.

As we see the p value of Group A as well as Group B <0.0001. Hence the result shows Group B is more effective than Group A.

The study was focused to reduce pain and to improve foot function in plantar fasciitis patients. Self stretching with cryotherapy and myofascial trigger point release with cryotherapy were given as treatment to both groups. In this study both groups reported an overall reduction in pain. Self stretching with cryotherapy shown more effectiveness in reducing pain and improving function than myofascial trigger point release with cryotherapy.

LIMITATIONS OF THE STUDY:

- The sample size of the study was too small
- The duration of study was too less
- Baseline VAS score for all subjects was 8

RECOMMENDATION FOR FUTURE STUDY:

- The intervention can be given for a longer duration for more accurate results
- Sample size should be higher for generalization
- Its long term effect should be considered

CONCLUSION:

The result of this study shows that there is significant reduction in pain and increased foot function in both groups. Myofascial trigger point release with cryotherapy is effective in reducing pain and improving functional activity in plantar fasciitis.

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