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A CASE SERIES REPORT ON PLANTAR FASCITIS WITH TREATMENT OF CALF STRETCHING AND MUSCLE ENERGY TECHNIQUE

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ABSTRACT

Introduction:- Plantar fasciitis (PF) is one of the most common musculoskeletal complain of the foot affecting a huge population. Therefore this aimed to treat with the calf stretching and muscle energy technique(MET) in the management of pain and physical functioning of foot/ ankle in patients with plantar fasciitis(PF). Aim of the study is To see the effects of calf stretching and muscle energy technique(MET) on plantar fasciitis patients on using outcome measures Numeric pain rating scale (NRPS) and lunge test. Study type is case series report (a case series report on plantar fasciitis is presented) methodology is 4 participates (n=4) with Plantar fasciitis were included in this study. Calf muscle stretching and muscle energy technique was given to these patients along with conventional physiotherapy which includes cryotherapy, SWD. The predefined protocol was given for 10 days. The pain, range of motion, functional performance were assessed at baseline and post treatment using NRPS, LUNGE TEST. Conclusion is According to the findings of this case series report, 10 days protocol of calf stretching and muscle energy technique(MET) significantly reduced pain and improve the ankle joint range of motion in Plantar fasciitis (PF) patients.

KEYWORDS: The pain, range of motion, functional performance were assessed at baseline and post treatment using NRPS, LUNGE TEST.

INTRODUCTION

Plantar fasciitis (PF) is the most common cause of inferior heel pain among middle aged adults. It is aggravated by micro tears of the plantar fascia from repeated stretching during walking or running. PF may be adversely affected by factors, such as abnormal foot posture, lower extremity muscle weakness, Achilles tendon tightness, and being overweight. Therefore, the accurate diagnosis, assessment, and management of PF by clinicians and podiatrists is important. some studies have failed to show a significant difference in foot posture between patients with PF and healthy controls. Similarly, a Landorf et al. reported that foot posture did not differ between patients with and those without PF. Thus it is unclear whether abnormal foot posture such as flat feet, is a primary potential risk factor for PF. Hence weakness of extrinsic foot muscles such as the peroneuslongus and gastrocnemius, may be considered as a possible contributing factor to PF because they increase the stress on the plantar fascia., no study has investigated the correlation between the performance of lower extremity muscles, such as the hip, quadriceps, hamstrings, and ankle plantar flexor, and foot pressure among patients who have PF with and without a flat foot posture. The purpose of this study was to analyze the differences in lower extremity muscle performance, such as muscle strength and reaction time, and foot posture between patients who have PF with and without flat foot posture, using a quantitative measurement device and pedobarography. We hypothesized that there would be lower muscle strength, a faster reaction time, and higher foot pressure in the involved ankles of patients who have PF with flat foot posture compared with those without flat foot posture. The a etiology of plantar fasciitis is not

clearly understood but several risk factors such has bone spurs, pronated food type, obesity, limb-length discrepancy and work- related weight bearing appear to increase the risk of plantar fasciitis. The ankle range of motion has been shown to vary significantly between individuals due to geographical and cultural differences based on their activities of daily living, in addition to the method used for assessing range of motion. Motion of the ankle occurs primarily in the saggital plane, with plantar- and dorsiflexion occuring predominantly at the tibiotalar joint. Several studies have indicated an overall range of motion in the saggital plane of between 65 and 75°, moving from 10 to 20° of dorsiflexion through to 40-55° of Plantar flexion. The total range of motion in the frontal plane is approximately 35°. However, in everyday activities, the range of motion required in the saggital plane is much reduced, with a maximum of 30° for walking, and 37° and 56° for ascending and descending stairs, respectively.

Plantar fasciitis was thought to occur from a mechanical injury in which excessive tensile strain within the plantar fascia produces microscopic tears leading to chronic inflammation. However current understanding is that Plantar fasciitis occurs through a degenerative rather than an inflammatory process. That is a "fasciosis", rather than fasciitis, where tensile strain is the key feature in the pathogenesis. Specifically, the increased fascial load is sensed by the gap junctions between fibrocytes, which then mediate changes in the extracellular matrix, resulting in myxoid degeneration and fragmentation of the plantar fascia and perifascial structures. The aim of the study is to see effects of calf muscle stretching and muscle energy technique in plantar fasciitis patients on outcome measures of NPRS, Launge test.

METHOD

Participants: n=4 were recruited from the out patient of ANH hospital diagnosed with plantar fasciitis by taken complete history along with special test's before starting the intervention, a brief procedure about the treatment and its benefit was explained to the patient. A short explanation about possible improvements of the treatment simultaneously explained. Informed written consent was also obtained from the patient.

P1: Male patient age 19 student working for 12 hours with rest period 2 to 3 hours having complaint of pain. On physiotherapy assessment a) pain: Medial side of calcaneum with duration of 1 hour. Pain is aggravated on physical activity like prolonged standing, and awake early morning and relieve at rest like sitting and sleeping. b) range of motion of ankle of ankle dorsiflexion 10 degrees, plantar flexion 40 degrees, eversion 9 degrees and inversion 15 degrees.

P2: A female patient age 20 student working for 12 hours with rest period 6 hours having complaing of pain. On physiotherapy assessment a) pain; left side of calcaneum with duration 1hour. Pain is aggrevated on physical activity and relieve at rest. b) range of motion of ankle was taken ankle dorsiflexion 15 degrees, plantar flexion 48 degrees, eversion 8 degrees, and inversion 20 degrees.

P3: Male patient age 22 student working for 9 hours with rest period 6 hours having complaint of pain. On physiotherapy assessment a) pain: bilateral side of calcaneum with duration 2 hours. Pain is aggrevated on physical activity and relieve at rest. b) range of motion of ankle was taken i.e. ankle dorsiflexion 13 degrees, plantar flexion 45 degrees, eversion 8 degrees and inversion 18 degrees.

P3: Female patient age 21 student working for 10 hours with rest period 6 hours having complaining of pain. On physiotherapy assessment a) pain: right side of calcaneum with duration 3 hours. Pain is aggrevated on physical activity and relieve at rest. b) range of motion of ankle was taken i.e ankle dorsiflexion 10 degrees, plantar flexion 40 degrees, eversion 7 degrees, and inversion 15 degrees.

1) CALF MUSCLE STRETCHING: Participants in the stretching group were then given a wooden stretching wedge on which to perform all stretches. This wedge was used to standardise the stretching technique across the participants. The stretching was to be performed while standing. Participants were instructed to move their forefoot up the wedge until a stretch could be felt in the calf muscle while keeping their heel on the ground. They were adviced to stretch the muscle for at least 5 minutes a day. They were permitted to stretch in smaller sessions as long as a total of atleast 5 minutes a day was achieved.
2) MUSCLE ENERGY TECHNIQUE: It was applied with subjects in supine position and foot extended over the edge of the couch keeping the knee in full extension for gastrocnemius and knee slightly flexed position for soleus muscle. The therapist was in walk standing position on the affected side. Subjects ankle joint was dorsiflexed by the therapists hand until a resistence or discomfort was felt. This position was held and subject was asked to exert effort towards plantar flexion for a period of 5 to 7 seconds with appropriate breathing, then resistance was slowly released and relaxation for a period of 5 seconds was given, during this relaxation period, ankle was passively dorsiflexed to a new barrier. A set of 5 repetitions were given for each treatment session for gastrocnemius and soleus muscle separately. This technique was applied three sessions per week for four weeks.

OUTCOME MEASURES

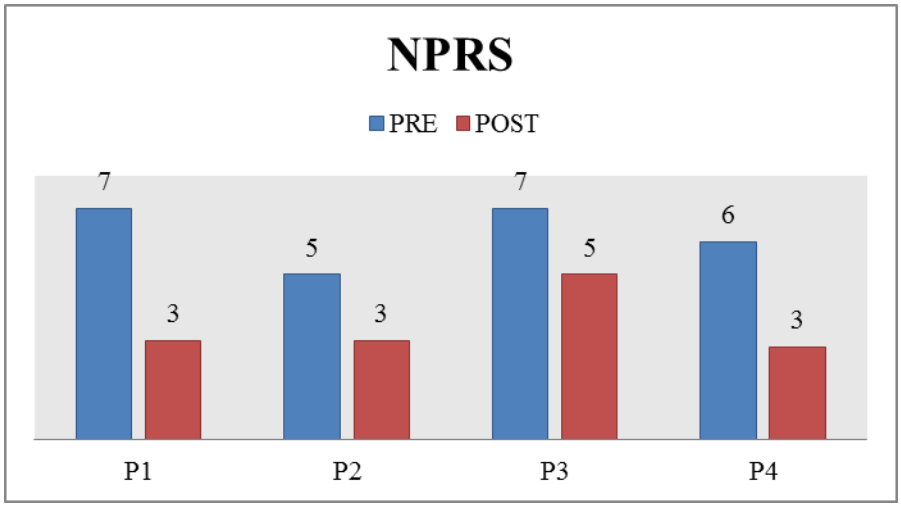
1) NRPS SCALE: It is a ordinal scale to measure a pain level, having 0-10 in which 0 is no pain 10 is most intense pain.
2) LUNGE TEST: Measuring weight bearing ankle dorsiflexion range. It is help to identify risk of lower

extremity injuries include ACL rupture ankle sprain, tendinopathy.

RESULTS

Table 1: NPRS.

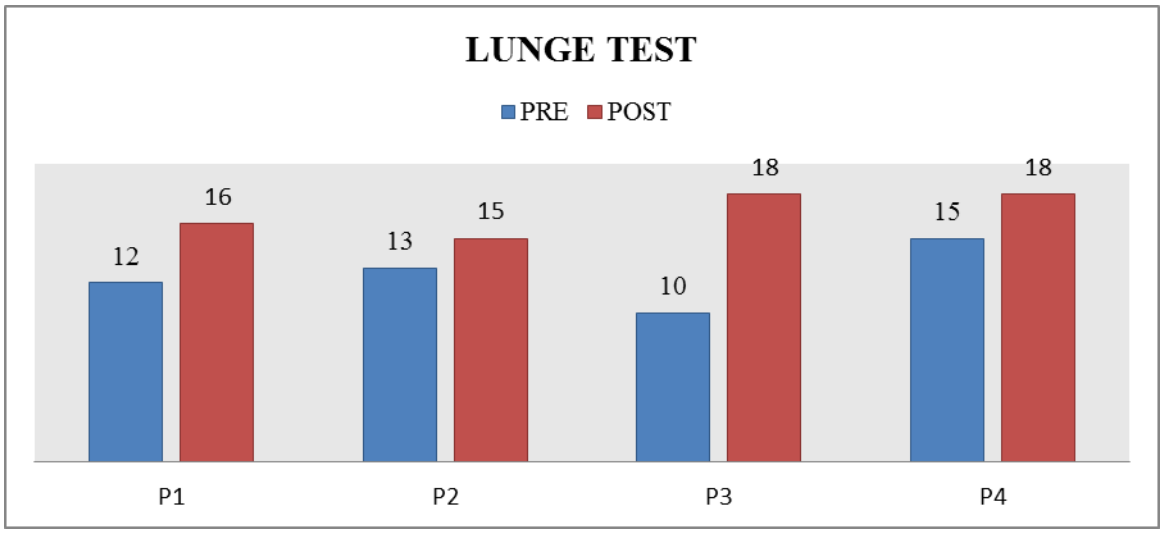
Outcome measures	P1	P2	P3	P4
PRE	7	5	7	6
POST	3	3	4	3



Interpretation: On above mentioned table 1 and graph 1 there is significant improvement on NPRS in all 4 patients, on compare with PRE and POST.
i.e. P1: PRE 7 and POST 3
P2: PRE 5 and POST 3
P3: PRE 7 and POST 5
P4: PRE 6 and POST 3

Table 2: lunge test

PRE	12	13	10	15
POST	16	15	18	18



Interpretation: On above mentioned table 2 and graph 2 there is significant improvement on LUNGE TEST in all 4 patients, on compare with PRE and POST.
i.e. P1: PRE 12 and POST 16
P2:PRE 13 and POST 15
P3: PRE 10 and POST 18
P4: PRE 15 and POST 18

DISCUSSION

The present case series report on plantar fasciitis with 10 days of intervention on use of techniques, calf muscle stretching and muscle energy technique, were showed significant improvement on NPRS score and lunge test. The muscle energy technique is a manual therapy that uses the gentle muscle contractions of the patient to relax

and lengthen muscles and normalize joint motion. The benefits of muscle energy technique are to reduce pain, reduce muscle tone, stretch tightened muscles, improve local circulation, improve local oxygenation, venous and lymphatic circulation and mobilize joint restrictions and in-turn improve range of motion. Muscle energy technique (MET) plays an important role in condition such as neck pain, lower back pain etc. This technique is also used to strengthen a physiologically weakened muscle or group of muscles to reduce localized edema, to relieve passive congestion, and to mobilize an articulation with restricted mobility. Whereas on use of calf stretching is low impact exercise there can increase your short term range of motion and reduce the pain also improve walking style. Hence calf muscle stretching exercise program for recovering from pain and improving standing and mobility function in patient with plantar fasciitis. By above mention benefits of calf stretching and muscle energy technique on plantar fasciitis, as there significant reduction in pain and improve range of motion in our patient, on basis of strengthening muscle and normalize joint motion which biomechanically reduces feet having plantar fasciitis. These both techniques are effectively improved circulation. Hence both techniques are beneficial for plantar fasciitis on pain and mobility and improve range of motion and improve quality of life. So that we concluded that by using calf muscle stretching and muscle energy technique there is a significant reduction on foot pain and improving angle of motion of ankle in patients with plantar fasciitis. These techniques can also be applied to increase blood circulation.

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