Original Article

A Study of Effectiveness of Calf Stretching in Managing Catastrophizing Pain in Plantar Fasciitis

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Abstract

Background: Calcaneus distress is a frequent moan in the trotter and talus , and plantar fasciosis , which accounts for 11–15% of adult patients' symptoms of the foot need medical attention. One in ten people are predicted to get PF at some point in their lives. It is further prevalent in mid-life fat women and adolescent athletes. The desire of this project is to evaluate the success of calf stretching by theraband among plantar fasciitis patients.

Purpose: To determine the effects of calf stretching using theraband on managing pain among plantar fasciitis patients

Materials and Methods: Fifty eight people were covered for addition and prohibition. They were splitted into two groups: passive calf stretching group (29) and self-calf stretching group (29). The pre and post-test values were measured by pain catastrophizing scale. Group-A received passive calf stretching using theraband and group-B received self-calf stretching. Both programs were given for 2 weeks, weekly 5 days.

Result: Using pain catastrophizing scale, Group A's (Passive calf stretching group) post-test mean was 27.38 and whereas group B's (Self calf stretching) was 32.24. This demonstrates that group-A has decreased pain catastrophizing score less than group-B. And this suggests that group A showed considerably finer than group B.

Conclusion: Passive calf stretching using theraband by group-A was found to be more effective than self-calf stretching of group-B..

Keywords: Plantar fasciitis, calf stretching, theraband

Introduction

The beginning of the plantar aponeurosis the near midline of heel bone nodule , as well as the nearby connective tissues, become inflamed due to degenerative processes, resulting in plantar fasciitis. The fascia itself plays a crucial role in cushioning shock and supporting the arch. Although the diagnosis includes illness, it is distinguished by the absence of inflammatory cells. Patients with this illness frequently have tight soleus, gastrocnemius, and/or related posterior leg muscles.[1] Bursitis is a frequent charge in the base and talus , which accounts for 11–15% of adult patients' symptoms of the foot requiring medical attention, is the habitual of adult patients' stubborn pain beneath the heel.[2] One in ten

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persons are predicted to get PF at some point in their lives. The frequency of PF is higher in the athletic population, while not all cases necessitate medical attention. It is additionally prevalent in adulthood aged obese females and adulthood sports person.[3] Expanded quetelet index (BMI) and jogger heal in lack of sports activity in people have a substantial correlation, according to the literature. According to the data, height and PF are unrelated, in contrast to weight. Additionally, increasing heaviness is linked to PF, rarely with shorter stature. The main risk of plantar fasciitis are females who are pregnant or obese or both in the middle of the age of 40 and 70 have extremely elevated arches or flat feet possess tense. Rarely does further research need to be done after a clinical diagnosis of PF.[4] The subjects tells of discomfort in the side of the 1st metatarsal bone, which is obvious with the first steps after some time period of inactivity and normally gets better when the subjects increases their level of work along the day, but tends to get worse as the day goes on. Following extended weight bearing, symptoms may worsen; this is frequently brought on by an increase in weight-bearing activities. Paresthesia is rather rare. While PF often presents unilaterally, up to 30% of patients do so bilaterally MRI may be utilized in suspect cases that don't respond to traditional therapy or added possible etiology of jogger heal, including tibial nerve dysfunction, cartilages and bone cancer, infection of the bone and fractures due to stress are suspected. [5] Upon ultrasound examination, the plantar fascia frequently exhibits calcifications, intra substance rips, thickness, and heterogeneity. These alterations, which are frequently seen by ultrasonography, point to a non- inflammatory state and an uncooperative vascular. It is thought that the ailment first manifests as micro tears brought on by the repetitive tension of weight bearing and upright posture. Chronic fascia degradation from the plantar fascia's continuous stretching eventually causes pain while sleeping or at rest.[6,7] The biggest risk factor in non-athletes, according to one study, is decreased ankle dorsiflexion.[8] As a result of the foot over pronating due to limited ankle dorsiflexion, which can lead to an overuse injury.[9] The propensity to overestimate the warning worth of torture signal and to powerlessness in the presence of pain are characteristics of severe catastrophizing. It is also identified by a relative incapacity to stop or suffer-connected feeling in advance of, throughout, instead preposition after a discomfort occurrence.[10] In individuals with PF, a stretching exercise programmed at home proved successful in lowering pain and improving the strength of the external and internal foot muscles.[11] Exercises to stretch gastrocnemius, soleus, and fascia that were part of the programmes. Each exercise took in the middle of twenty -thirty seconds to complete, with a ten- second break in the middle of each set of stretching. Over the course of three weeks, they invested a total of about twenty minutes in the exercise, working out five days a week. So, the research was to find the effectiveness of calf stretching in plantar fasciitis patients through a pain catastrophizing scale.

Material and Method

This was an experimental study done with 58 subjects with plantar fasciitis, aged between 25-60 years of both genders from a private clinic from Chennai. Samples were conveniently selected and allocated into two groups.

Study period: December 2022 to June 2023

Inclusion Criteria

- BMI-25 to 35
- Patients of both genders between the ages of 25 and 60 were enrolled.
- Windlass test positive

Exclusion Criteria

- Foot ulcer
- Recent ankle surgery
- Fracture of ankle joint

Material Used

- Theraband

Outcome Measures

Assessment was done at initial and at the end of the study using

The pain catastrophizing scale: Was created to assist a person's agony event by query regarding their feeling with thoughts during time of pain .This questionnaire is distinct from other methods of measuring pain related thoughts in the subjects but

not required to be in pain while completing it. On a scale of 0 (not at all) to 4(always), participants are asked to rate how often they have the aforementioned thoughts and emotion when they are in pain Three subscales scores measuring cogitation, exaggeration, weakness and bearing. with a total score(range from 0-52).[12]

Procedure

Fifty eight subjects diagnosed with plantar fasciitis by windlass test were screened for inclusion and exclusion criteria and selected from sri jhanani clinic and goodness physiotherapy clinic. All participants are requested to indicate their conscious consent form. The instructions were given to the participants clearly. The subjects were splitted into two groups (Group-A- 29, Group-B- 29). The pre and post-test values were measured by pain catastrophizing scale. Group-A received passive calf stretching using theraband whereas Group-B did Self calf stretching.

Passive calf stretching group: Legs straightened, sit on the mat or other solid surface. While holding the theraband, keep your arms at your sides and relax. As the therapist, make sure you have a firm hold on the theraband and that it is tightly wrapped over the heel of your foot. Maintain a straight back and proper posture when you sit up tall. The therapist will slowly pull the theraband in the direction of flexing your ankle joint upward. The band will feel the tension as a result. Pull on the rope until your calf muscle stretches comfortably. Use caution. Feel the strain in the muscle of your calf as you maintain the position for fifteen to thirty seconds. Return to the beginning position gradually while loosening the band on your Thera band and relaxing your ankle. A minimum of three to five repetitions on each foot should be enough to complete the stretch. Self stretching group: Locate a wall or other reliable vertical surface to lean on. Make sure all obstructions are removed. Place your arms at roughly arm's length from the wall as you face it. Maintain a hip-width distance in the middle of your feet, using one of your feet little in place of the other. Keep your arms straight and place both hands at shoulder height on the wall. Your front foot should remain firmly on the ground as you advance. The heel of your back foot needs to be firmly placed on the ground. Lean forward gradually, allowing your weight to transfer in the direction of the wall. The calf muscle in your back and the leg should feel stretched. Avoid rounding your shoulders and maintain a straight back. To manage the stretch's severity, keep your front knee slightly bent. Focus on deep breathing while holding the stretches for in the middle of 20 and 30 seconds, letting the muscle relax. Step back and swap legs, then carry out the exercise again on the other side after the allotted amount of time. A minimum of three to five repetitions on each foot should be enough to complete the stretch. Total duration of therapy was 10 sessions, 5 sessions each week for 2 weeks.

Data Analysis

Statistical analysis was done to evaluate the effects of calf stretching among plantar fasciitis patients. Pre and post result values for pain catastrophizing scale were noted and paired, unpaired t test was conducted. The pre-test mean value of pain catastrophizing scale in passive calf stretching group and self calf stretching group are 37.52 and 35.76 and with p value of <0.0001

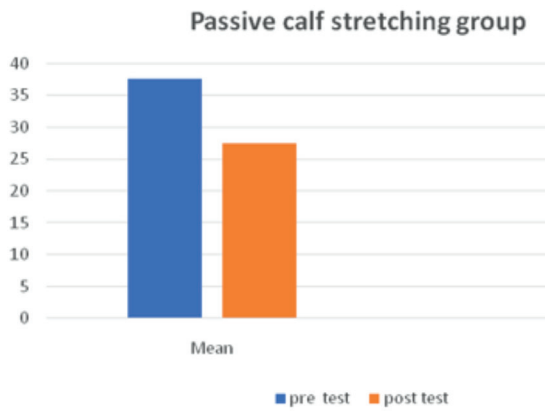

Fig-1 Pre and posttest analysis of passive calf stretching

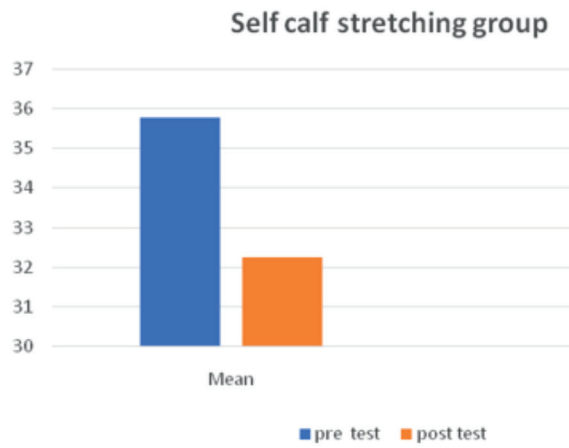

Fig-2 Pre and post test analysis of self calf stretching

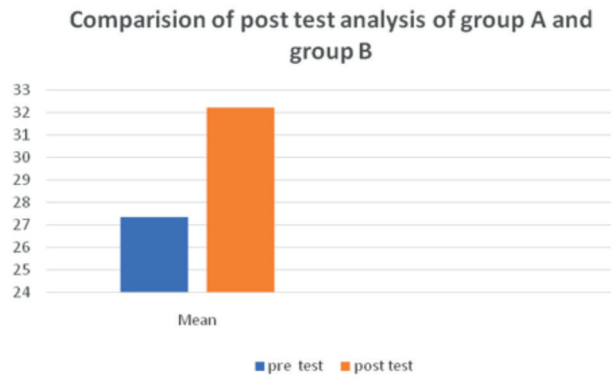

Fig-3 Comparing post test analysis of group-A and group-B

Result

All 58 subjects completed the study successfully pre-test and post-test values of passive calf stretching group and self stretching group The statistical analysis of quantitative data of the passive calf stretching groups and self calf stretching groups, as well as within the groups, showed a statistically significant variation.

The statistical analysis of pre and post test of passive calf stretching group by using pain catastrophizing scale, pre- and post-test values of mean 37.52 and 27.38 , SD value of 2.77 and 1.86 , P <0.0001 were statistically significant.

The statistical analysis of pre and post test of self calf stretching group by using pain catastrophizing scale, pre- and post-test values of mean 37.76 and 32.24 SD values of 2.67 and 2.40 and P <0.0001 were statistically significant. The statistical difference in middle of the passive calf stretching and self calf stretching subjects was evaluated by post values of pain catastrophizing scale and comparison of post test of passive calf stretching and self calf stretching test of mean 27.38 and 32.24 and ; SD value of 1.86 and 2.40 and P value is <0.0001. These values were considered to be extremely statistically significant. These differences indicated that the subjects received passive stretching, was highly effective in reducing plantar fasciitis.

Discussion

The dense connective tissue on the foot, which attaches your tarsal bone to your digit, becomes inflamed while you have fasciitis. Heel awkwardness from plantar fasciitis can be excruciating. One of the frequent sources of calcaneal discomfort is plantar aponeurosis. The condition known as jogger heal is thought to be the reason for 1 million health care visits annually. About 10% of injuries suffered by runners are caused by plantar fasciitis, which also accounts for 11–15% of foot problems that need medical notice. It is estimated that 10% of the wider population also has it. A statistically significant difference in the middle of groups A and B as well as with each group was found by statistical analysis of quantitative data. Using a pain catastrophizing scale, group A's (Passive calf stretching group) post-test mean was 27.38 whereas group B's (Self stretching) was 32.24. This demonstrates that group-A has decreased pain catastrophizing score less than group-B. This suggests that group-A performed considerably better than group B. This strongly suggests that passive calf stretching is effective in decreasing suffering and thus improves function in plantar fasciitis subjects Cole C,et al., (2005) in his research concluded that ample research has not been done on the majority of interventions used to treat plantar fasciitis, however footwear inserts and lengthen exercises, nontropics injections, and specially constructed ankle foot orthosis may be helpful.[2] Fabrikant JM, et al., 2011 june in his research concluded that investigation, it was discovered that therapeutic treatment using injection and biomechanical adjustment does actually reduce the thickness of the plantar aponeurosis as seen on ultrasonography.[5] In 2018, Sep, Ling Y, et al., concluded that when it came to lowering pain and enhancing operation in those suffering from plantar fasciitis, platelet rich plasma was just as successful as alternative treatments. According to subgroup analysis, PRP had a better impact on AOFAS Score than steroids did, and this impact lasted for a considerable amount of time. More extensive RCTs are necessary to support the present findings, though, given the inherent flaws in this study.[6] A quetelet Index and plantar fasciopathy are consistently connected clinically, according to our research. In the middle of subgroups of athletes and non-athletes, this correlation may be different. The orthodoxy concerning clinical and mechanical evaluations of the ankle and foot function is not supported by consistent evidence, despite a variety of soft tissue and bone

problems being supported by such evidence. In a collaborative decision-making process, therapists can use this knowledge.[9]

Conclusion

This finding led to the conclusion that passive calf stretching using theraband training was found to be more successful than self calf stretching in lessen suffering and restoring mission and well being in long-suffering case also managing catastrophizing pain in plantar fasciitis subjects

Ethical clearance: Taken from the institutional ethical committee.ISRB number 03/078/2022/ISRB/SR/SCPT

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Conflict of interest: No conflict of interest during this research.

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