Original Research Article

# Comparitive study between stretching exercises and corticosteroid injection in treatment of patients with plantar fasciitis

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## Abstract

**Introduction:** Plantar fasciitis is the commonnest cause of heel pain. Its cause is uncertain so as there is a lot of treatment methods for it. Our study compares the outcome of two common treatment modaliy known as local infiltration of steroid injection and plantar fascia stretching exercises with each other regard to decrease pain intensity and improvement in function. Materials and methods: 80 patients with complain of heel pain clinicaly diagnosed as plantar fasciitis are included in the study. Other causes of heel pain are ruled out in them. One group with local steroid injection while the other group was treated with plantar fascia stretching exercises. They are re evaluated regard to function and pain scores after 2 and 10 weeks, Results: Two groups were similar regard to sex, age, height, weight and body mass index .Significant decrease in pain and improvement in function was reported in steroid group but, after the 10th week, two groups reported the same results in those manners. Discussion: It seems that because after 10 weeks of treatment with both therapeutic methods, the results were comparable , it is better to use the less complicated and less invasive method (stretching), but in cases which prompt pain relief and better function is desired, local steroid injection may be better.

**Key words:** Planter fascia, Steroid, Streatching exercises

## Introduction

Plantar fascitis is the most prevalent cause of pain in the heel [1] and includes about 11-15% of all causes of foot pain which need treatment [2]. Plantar fascitis is a degenerative syndrome of plantar fascia and 50% of cases are associated with calcium precipitation at the attachment site to the heel bone (calcaneous), hence it is called heel spur. According to most studies, partial rupture of this fascia and chronic inflammation at the attachment site to the bone leads to the presipitation of symptoms [3,4].

However, various etiologies have been proposed such as being overweight, specific occupations, anatomic variations in the foot, biomechanic problem in the foot, and wearing in appropriate footwear. This disease is commonly reported among females between 40-60 years old [5], and has insignificant association with socioeconomic status. Patients experience annoying pain and make them consult to clinics frequently.

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Symptoms of this syndrome includes plantar pain especially in the medial and inferior parts of the heel which flares up after standing up from chair or bed in the first few steps and then decreases. The diagnosis of this disease is based on clinical history and physical examination. Laboratory tests and radiological imaging are applied to exclude other causes such as infection or tumor. 30% of cases found tobe bilateral and these bilateral cases, often associated with rheumatoid arthritis, ankylosing spondylitis, and Reiter's syndrome.

On physical examination, the patient feels tenderness with deep palpation of medial and lateral parts of the heel and the tenderness increases with raising big toe and fingers with the other hand.

This condition is self-limiting, but its course may last for 6-18 months. hence, patients seek medical attention to relieve pain [6]. In most cases, resting with non weight bearing on the foot causes improvement in pain [7] and in some cases changing footwear decreases the symptoms.

Appropriate physical programs and stretching of the plantar fascia and Achilles tendon and overcoming their stiffness and reinforcement of interosseous plantar muscles are all effective modalities of treatment. Therefore, some patients have practiced rotating tennis ball with the plantar aspect of their feet or standing close to wall and leaning forward while the plantar aspect of the foot is on the ground [8], On the other hand, local application of steroidal and non-steroidal anti-inflammatory drugs (NSAIDs) or corticosteroid injection at the symptomatic site have been effective in releaving symptoms [9]. Other treatment modalities such as medical footwear, orthosis or casting and even shock waves have been tried for treatment but none of them showed significant improvement [10-12].

This study was conucted to compare two common treatment methods including local corticosteroid injection and heel stretching exercises.

## Materials and Methods

This study was conducted as a clinical trial between 2015 to 2017 in Smt. B.K. shah medical institute and researh center, Waghodiya, Vadodara in Patients with a history of at least 6 months of heel pain and clinically diagnosed as plantar fascitis were included in the study.

Exclusion criteria were associated chronic systemic diseases, preexisting inflamatory disorder, history of surgery or severe trauma to the heel or fracture of the heel, and heel pain due to causes other than plantar fasciitis. For exclusion of other causes of heel pain complete blood count, blood sugar level, serum calcium level, phosphorus level, alkaline phosphatase level along with erythrocyte sedimentation rate and C-reactive protein were evaluated. Antero-posterior and lateral radiographes of symptomatic foot were also evaluated. Then the patients were divided into two treatment groups after a written conscent. The pre-designed questionnaire was filled by a physician who was not aware of the treatment options. In corticosteroid group, local injection of 25 mg corticosteroid was injected at the site of maximal pain at the planter aspect of the foot and then the patient was resting for 24 hours. In weeks 2 and 10, clinical examination in terms of pain and function was performed. In other group, stretching of plantar fascia was advised and similar to the first group, before intervention and at weeks 2 and 10 clinical assessment was performed.

For pain mesurement, a visual analogue scale was used. Functional evaluation was based on need to walking aid. The method of stretching exercise was as follows: the patient sits comfortably on a chair and puts his/her affected foot on the contralateral knee and pushes back big toe and other toes with the ipsilateral hand. The patient must put his contralateral hand on the planter surface of the foot and feels its stretching and stiffness during passive dorsiflexion of toes. The patient should stretches plantar fascia for 10 seconds at he time of exercise. This exercise was done thrice a day and the patient should do the aforementioned exercise for 10 times. The results of the two groups were compared by using t test and chi-squared tests. Significance level was set at P value < 0.05. All statistical analyses were done using SPSS software fro Windows (Ver. 11.5).

## Results

80 patients remained until the end of the study. According to the obtained results, mean age of the two groups was similar and was 51.3 and 50.5 years in corticosteroid and stretching exercise groups, respectively. The two groups were also comparable in terms of gender. Mean height and weight of the two groups was also similar without significant statistical difference.

According to the clinical evaluation which is presented in Table 1, the pain severity before any intervention was almost similar in both groups. However, on second evaliation in the 2 nd week of the study the pain in corticosteroid group showed significant improvement compared to the group which received stretching exercises. After 8 weeks, the pain severity improved in both groups however was comparable between them.

**Table-1: Pain severity before intervention and after 2 and 8 weeks following intervention.**

| | Mean pain severity in corticosteroid group | Mean pain severity with stretching | P value |
|---|---|---|---|
| Before intervention | 6.9 | 7.2 | 0.7 |
| After 2 weeks | 2.8 | 4.2 | 0.0 |
| After 8 weeks | 2.8 | 2.3 | 0.23 |

In Table 2 the results of functional out come of treatment in the patients at weeks 2 and 8 are shown. As observed, the functional level of the patients was similar before the treatment, but at week 2 after treatment functional level of patients who have received local corticosteroid injection improved significantly in comparison to stretching exercises group. After 8 weeks, functional level improved in both groups, it was comparable between them.

**Table-2: Patient functional level before intervention and after 2 and 8 weeks following intervention.**

| | Functional level in corticosteroid group | Functional level in stretching exercises group | P value |
|---|---|---|---|
| Before intervention | 76 | 79 | 0.6 |
| After 2 weeks | 92 | 84 | 0.004 |
| After 8 weeks | 93 | 92 | 0.7 |

## Discussion

Since plantar fascitis is the commonest cause of pain in the inferior parts of the foot and is the cause of & gt;15% of cases present due to foot pain and due to malfunction which it produces. It has high prevalence in all age groups, genders and socioeconomic group, hence this condition and its treatments are always important for clinicians and several research have been done on it. Access to the most efective treatment with least complication and minimal expenses is the objective of most of the studies. In a study done by Benedict et al. in 2003 in the US, 101 patients with chronic plantar fascitis with a mean age of 46 years were studied.

They reported that most of the patients completed supportive treatment modality with satisfaction and very few number of patients required other treatment options [13]. Agin Benedict et al. in 2006 in the US conducted a clinical trial on 66 with a 2-year follow-up. They reported that stretching Achilles tendon appear to be more effective than other methods. Their results showed that 92% of all patients were satisfied with this treatment and 77% did not have any difficulty or limitation in performing stretching techniques. The authors concluded that stretching exercises of plantar fascia are more effective and less expensive in comparison to other treatments [14]. Frater et al. in 2006 in UK studied the effectiveness of local corticosteroid injection in patients having plantar fascitis. They used bone scan to confirm diagnosis of heel pain syndrome and follow-up.

They used primary phase changes for prediction of effectiveness corticosteroid injection. out of 24 patients, among them 8 had bilateral involvement (overall 32 feet) were included. After injection, pain was improved completely or nearly completely in 20 feet. The rest 12 feet showed temprary or no pain alleviation [15]. Craw ford et al., studied short-term effects of corticosteroid injection. The effectiveness of local corticosteroid injection in study patient group was compared with the effect of local anesthetic in control group in the treatment of planter fascitis. In addition, the effect of anesthesia was also evaluated. The study population included 106 patients and the results were evaluated using VAS at 1, 3, and 6 months after traetment.

They noted that corticosteroid injection releive pain in short-term interval time, but heel anesthesia before loal corticosteroid injection has no effect on treatment [16]. There were no previous study comparing the therapeutic effects and complications of local corticosteroid injection versus heel stretching exercise.

This study was designed to compare the outcome and complications of local corticosteroid injection versus heel stretching exercises. Our results reveal that although most patients with plantar fasciitis are female in the age range of 40-78 years, there was no significant difference in distribution among gender. This finding is similar with that of study done by Berretta et.al [9] In our study we did not find any significant corelation between height, weight and body mass index (BMI) and the rate of responsiveness to treatment.

Treatment response was evaluated by two methods in our study. The first was pain intensity through visiual analauge scale. The second was function score which was based on the requirment of walking aid to start movement.

According to our results, pain responded dramatically to local corticosteroid injection. The patients who received local corticosteroid had better pain scale and function score after two weeks as compare to those who did not receive corticosteroid. This difference was statistically significant. But after 8 weeks both groups had decreased pain and better function prior to treatment with a significant difference. The difference between

the two groups after 8 weeks with respect to pain and function was not significant In conclusion, there is no difference between corticosteroid injection and heel stretching exercises in plantar fascitis in long-term follow-up. Also complications such as weakness and sometimes rupture of plantar fascia and fat pad atrophy are attributed to repeated local corticosteroid injection therefore repeated injections are not recommended for plantar fasciitis.

We recommond that for long term management of this condition, heel stretching exercises are more safe, cost effective and appropriate methods but problem with this method of treatment is patient compliance. However, according to the need of our society and the expectations of the patients, combination of different treatments is more affective in achieving better results and this is also a day care procedure.

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