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Results of rest, soft sole slippers, contrast bath and plantar stretches physiotherapy in case of plantar fasciitis

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Abstract

Almost 10 lakh patients are affected by plantar fasciitis (PF), which is the commonest cause of chronic heel pain. This condition is often managed conservatively, and many rehabilitation protocols, some with the aid of orthoses, have been adopted, with good-to-excellent clinical results. Although most cases of chronic PF can be successfully managed with a conservative approach, alternative treatments, including high-energy shock wave therapy and corticosteroid injections, are commonly accepted as second-line treatment when traditional conservative therapy fails.

The literature suggests that, initially, traditional conservative treatments consisting of rest, oral nonsteroidal anti-inflammatory drugs, foot orthotics, and stretching exercises can be tried for several weeks. In patients with chronic recalcitrant PF, extracorporeal shock wave therapy or corticosteroid injection can be considered. Surgery (Minimally invasive techniques) should be considered only after failure of the conservative treatments.

Objectives: To study the effectiveness of Rest, exercises (Plantar fascia stretching technique), soft sole slippers and contrast bath with in patients with plantar fasciitis in fresh as well as recurrent cases.

Materials and Methods: In the prospective study totally 30 subjects was taken, between the age group of 20 to 70 years in our Patients department Orthopedics at Tertiary care Hospital Surat with short follow-up of 2 weeks.

Results: On comparing the Pre and post -test mean values of group nova's score and foot functional index shows significant reduction in posttest mean in both the group. No patient in our study was noncompliant to conservative treatment in 2 weeks follow-up.

Conclusions: The Present study concluded that 2-weeks treatment program performed on subjects with plantar fasciitis demonstrated that both contrast bath and plantar fascia stretching exercises combined with rest & soft sole slippers were effective in reducing pain intensity and improving functional activities.

Keywords: heel spur, plantar fasciitis

Introduction

Plantar fasciitis is one of the common conditions and it accounts for an estimated one million visits per year to orthopaedic OPDs [2]. The term "plantar fasciitis" has been quoted for years, but this it is misnomer as inflammatory cells are not present in biopsies from involved fascias [3]. Therefore, Lemont *et al* advocate the terminology "plantar fasciosis" to explain the syndrome characterized by pain along the proximal plantar fascia and its attachment in the area of the calcaneal tuberosity with function impairment, implying a more chronic degenerative process in comparison with acute heel pain [3]. In published studies, the term "heel pain syndrome" has been used for patients with PF. We believed this term might be too generic and should be used only for plantar heel pain. In this study, we used the term "plantar fasciitis" to refer to the presentation of patients with plantar fasciopathy and facilitate the comparison between published studies. The plantar fascia is formed from collagen fibers originating from the calcaneus tuberosity (medial aspect) and inserted into the of the proximal phalanges (dorsal aspect) and the sheaths of flexor tendon [5].

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Although being one of the commonest causes of heel pain, usually the disorder is frequent in runners and people who are over-weight and people who overuse standing position for long time; it is also prevalent in patients with inflammatory arthritis¹ like Ankylosing Spondylitis / Rheumatoid Arthritis. Plantar fasciitis involves predominantly the proximal insertion of the aponeurosis (Enthesis) which is specifically adapted to shearing and bending forces; also, entheses play a role in redistribution of compressive forces. The etiology of plantar fasciitis is assumed to be due to excessive tensile loading, exacerbated by abnormal biomechanics of the legs such as flat foot, leg length discrepancy, and calf muscles tightness^[1, 4]. The purpose of this study was to analyze results of various techniques such as Rest exercises, soft sole slippers and contrast bath for plantar fasciitis and to identify which one showed effectiveness and scientific validation.

Aims and Objectives

To study the effectiveness of Rest, exercises (Plantar fascia stretching technique), soft sole slippers and contrast bath with in patients with plantar fasciitis in fresh as well as recurrent cases.

Materials and Methods

Place of study: In the prospective study totally 30 subjects was taken, between the age group of 20 to 70 years in Our Patients department Orthopaedics at Tertiary care Hospital Surat.

Type of study: The study was prospective type of study.

Sample collection: The sample collection period was May-June 2018.

Study duration: 2 weeks

Criteria for patient inclusion

Participants with clinical diagnosis of plantar fasciitis, both male and female patients between the age 20-70years, those who were willing to participate in the study and willing to take treatment for 2 weeks, Pain in the heel on the first step in the morning.

Criteria for patient exclusion

- Infective conditions of foot, tumor, calcaneal fracture
- Metal implant around ankle
- Dermatitis, acute sepsis and anesthetic areas
- Subject with impaired circulation to lower extremities
- Subject with referred pain due to sciatica, Corticosteroids
- Injection in heel preceding 3 month, Patient who cannot co-operate

Conflict of interest: 'Conflicts of interest: none'

Funding: This is a self-funded study.

Methodology

Contrast Bath: This was instructed to patients by us to the patients and to be done by them at their homes. The patient was instructed to sit on the stool or wooden chair. We instructed them to place both the leg in the tray containing hot water (Approx. 42⁰ C) for 4 minutes and cold water (Approx. 15⁰ C) for 1 minute. The whole cycle is repeated for about 5 times [2 session/day for 6 days /week for 2 weeks].

Active stretching

Patients were instructed to do stretching exercises twice a day; First in the morning, before getting out of the bed and second at the night time while sleeping. They were instructed to dorsiflex the ankle joint, hold the position for 12-15 seconds and repeats 10 times; followed by Plantar flexion and repeat the same.

Soft sole slippers

Patients were instructed to wear 'Ortho-Rest' brown slippers, if possible all the day inside as well as outside home. They were instructed to not to touch ground with bare foot.

Rest

Rest was actually in form of activity modification. They were instructed to at least take rest for 5 minutes in form of sitting after standing for 30 minutes if their jobs/work demanded it. Bed rest was neither advised nor necessary.

Outcome measure

Visual analogue scale

For measuring the intensity of pain, Visual Analogue Scale was used in the patients by determining their current pain by making a mark on a 10cm visual analogue scale. The left end of the scale was labeled as "No Pain" and right end of the scale was labeled as "Worst Pain" possible. The mark was then measured to the nearest millimeters from "No Pain" end (Zero) of scale.

Foot function index

Foot function index was designed to measure the impact of foot pathology on function in terms of pain, disability and movement restriction^[20, 21].

Follow up: After 2 weeks for final evaluation. Further follow up was necessary only if condition was not resolved; not for study purpose but for further treatment.

Results

Table 1: Comparison of visual analogue scale between

Vas scale	Mean	S.D	t -TEST	Significance
Pre test	8.2	0.723	0.280	0.826
Post Test	3.69	0.528	584	0.000

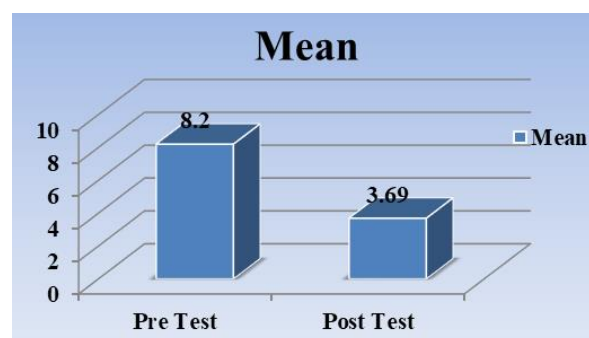
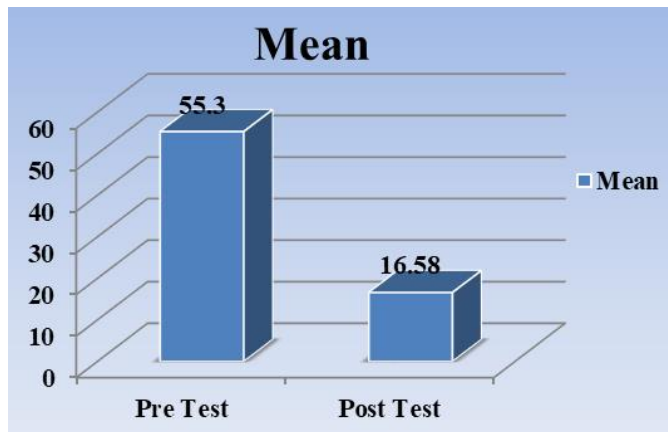


Table 2: Comparison of foot functional index (FFI) between Pre-treatment and post-treatment

Vas scale	Mean	S.D	t -TEST	Significance
Pre test	55.3	7.68	2.42	0.127
Post Test	16.58	5.39	5.54	0.00



On comparing the Pre and post-test mean values of group on VAS score and foot functional index shows significant reduction in post-test mean in both the group. No patient in our study was noncompliant to conservative treatment in 2 weeks follow-up.

However, limitation of our study was only 2 weeks duration was considered. May be long term follow up is required to know more about natural history of the condition.

Discussion

The present study was conducted to compare the effectiveness of contrast bath, rest, soft sole slippers with plantar fascia stretching in the treatment of plantar fasciitis for two weeks in terms of pain on Visual Analogue Scale (VAS) and functional disability with foot functional index (FFI). It was noticed that there was improvement in all the above parameters in post treatment patients. Improvement showed no statistical significance with respect to their gender distribution. The overall incidence rate of plantar fasciitis was 10.5 per 1000 population. Compared with men, women had a significantly increased incidence rate ratio for plantar fasciitis of 1.96 (95% confidence interval, 1.94 to 1.99). Increased body weight and body mass index have been shown to be significant risk factors for plantar fasciitis with a BMI more than 30kg/m² having an odds ratio of 5.6 (95% confident interval, 1.9 to 16.6; $p < 0.01$) compared with BMI of less than 25 kg/M.

Published studies have shown that the plantar fascia is involved in both the dynamic and static supports of the arch of the foot [6-9]. During walking/weight-bearing, stretching of the longitudinal arch is prevented by tension of the plantar fascia, muscles, and ligaments, with compression of the bones forming the arch itself [9]. Continuity of the plantar fascia into the Parthenon of the Achilles tendon has been shown in cadaver specimens, providing a positive correlation between Achilles tendon loading and plantar fascia tension.⁷ In cadaver studies, complete release of the plantar fascia decreased the height of the medial longitudinal arch during terminal stance as well as changed the distribution of plantar foot pressure, resulting in increased pressure on the central metatarsal heads [10-12].

The etiology of PF is likely multifactorial. Numerous factors, including flatfoot, advancing age, obesity, inappropriate footwear, and decrease in ankle dorsiflexion, have been associated with plantar fascia disorders [2, 13, 14]. While advancing age, which may induce plantar fascia degeneration and increased mechanical overload, is considered a risk factor for PF, the true pathogenesis remains unknown. A literature search for "articles about plantar fasciitis" was conducted on the PubMed database in order to identify publications addressing the current treatments of PF. Randomized clinical

trials, case series, surveys, and narrative reviews written in English and published in peer-reviewed journals were included in this study. Although a more valid approach requires systematic search strategies, the intention of this review is to describe the current therapeutic approaches and the context in which future studies should be situated.

Patients with PF will complain of plantar heel pain, which is exacerbated with the first step after a period of non-weight-bearing, typically in the morning. In the early stages, patients will report that their symptoms improve after a few steps or minutes, but, in the chronic stages, pain becomes blunt and constant [15]. The condition is generally self-limiting, and most of the cases spontaneously resolve regardless of the type of intervention received (including placebo). The painful symptoms usually spontaneously resolve within 10 months [15]. However, in approximately 10% of patients, the disease progresses to chronic pain [15]. Physical examination commonly reveals pain at palpation of the plantar fascia at the plantar aspect of the calcaneal tuberosity. Physical examination should, however, include the assessment of range of motion of the foot and ankle, focusing on limitation of ankle dorsiflexion, presence of hypesthesia or dysesthesia, and assessment of the forefoot/ mid foot/hind foot alignment. Passive ankle/first-toe dorsiflexion can cause discomfort or pain in the proximal plantar fascia and it can also cause painful tightness of the Achilles tendon. A fall from a height onto the heel may cause bone fractures involving the subtalar joint, the sustentaculum tali, the plantar calcaneal tubercles, or the inferior calcaneal spur. In most cases, diffuse pain in the hind foot is poorly localized in the heel itself [16]. A fracture is usually suspected with a history of trauma and focal pain at palpation. Acute plantar fascia rupture should be suspected in patients with a history of trauma and with negative radiographic and bone scan findings. Plantar swelling and ecchymosis of the heel are often present [17-19].

Conclusion

The Present study concluded that 2-weeks treatment program performed on subjects with plantar fasciitis demonstrated that both contrast bath and plantar fascia stretching exercises combined with rest & soft sole slippers were effective in reducing pain intensity and improving functional activities. There are conflicting results in the short and long term, probably because the exact etiology of plantar fasciitis and the subjective component of the pain do not allow a proper standardization of results; therefore, it is difficult using this type of review to identify which is actually the best treatment during various stages of plantar fasciitis. So long terms follow up is required to support our conclusion. But still this regimen is followed in all primary plantar fasciitis due to reduced costs and the safety of the procedure.

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