Determining the Mean Reduction in Pain Score After Treatment with Heel Pad in Planter Fasciitis

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ABSTRACT

Background: Plantar fasciitis is an inflammation of the plantar fascia localized most often at the attachment to the medial tubercle of the calcaneus, although it may extend distally along the fascia into the medial longitudinal arch. The use of orthotics to treat the heel pain associated with plantar fasciitis is both common and effective.

Objective: The main objective of this study is to determine the mean reduction in pain score after treatment with heel pad in plantar fasciitis.

Material and Methods: It was a quasi-experimental trial conducted at the Department of Rehabilitation Medicine, Saidu Group of Teaching Hospital for the period of 6 months. Sample size of 60 patients was calculated by using WHO calculator. Adults age 18 or older with clinical diagnosis of plantar fasciitis were enrolled who fulfilled the inclusion criteria. The informed consent was taken. Orthosis is made of soft molding material, was inserted in the inner sole of the shoe of affected side. A visual analogue scale (VAS) was used to assess a base line pain score in each subject in the initial visit and after 5 weeks of follow up the reduction in pain score was recorded and the difference was seen. Statistical analysis of data was done using SPSS 10.0. Quantitative variables like age and pain score before and after treatment are presented in the form of mean±S.D. Qualitative variables like gender is measured in the form of frequency and percentage. Mean reduction in pain score was calculated by subtracting pain score after treatment from baseline pain score.

Results: The mean age of all the patients was 38.73±11.72years. There were 36(60%) females and 24(40%) male patients. The mean age of male patients was 33.83±11.26 years and the mean age of female patients was 42±10.99 years.

Baseline mean pain score was observed as 10 and the mean pain score after 5 weeks of all patients was 1.67±2.75. The mean reduction in pain score was 8.33±2.75 (p-value = 0.000).

Conclusion: It was concluded that a heel pad that effectively manages this pain, is quick and easy to make, and is affordable. Pain relief and comfort are achieved through customizing the fit and by using materials that are soft and mold to the foot by using a costumed designed cutout in the heel pad to offer localized pain relief.

Key Words: *Plantar fasciitis, heel pad, pain, foot, Orthotic devices.*

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INTRODUCTION

Planter fasciitis (also referred to as plantar heel pain syndrome, heel spur syndrome, or painful heel syndrome) is, by definition, an inflammation of the plantar fascia.[1] The injury itself is an enthesopathy (an abnormality or injury at the site of attachment of a ligament or tendon to bone) of the origin of the plantar fascia at the medial tubercle of the calcaneus due to excess traction often characterized by pain on the first step in the morning.[36] Plantar fasciitis is generally believed to be due to repetitive partial tearing at this enthesis with associated chronic inflammation.[13] Plantar fasciitis is the most common cause of heel pain with a lifetime prevalence of ten percent, accounting for eleven to fifteen percent of all foot symptoms, and affecting two million people in the United States alone.[69]

Plantar fasciitis is usually seen as an overuse injury in athletes, runners in particular (accounting for nearly 10% of running injuries), but is also seen in the general population.[1,3,4,6,8] Some of the factors frequently believed to precipitate plantar fasciitis include aberrant foot biomechanics and/or foot types, improper footwear, and obesity.[3,4,6,] More specifically, foot over-pronation is believed to put increased tension on the plantar soft tissues and create the potential for injury to occur.[2]

The management of symptoms is the main stay of treatment. Conservative treatment such as stretching, icing, anti inflammatory and the use of orthosis is successful in improving function and reducing pain. In one study preorthotic scores were recorded at the initial visit, and post orthotic scores were recorded at the follow up visit. High scores indicated worse score pain. At the initial visit, the mean score was 5.70±1.95 Scores recorded at an average of 5 weeks after using the customized orthotic were 1.85±1.13. The mean difference in scores over the 5 week period was 4.17±1.92.

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All subject ranked their pain as being less after using the orthtotic[9]. There are no local references available.

The heel pad is fabricated from 4A Sorbothan A. Pain relief and comfort are achieved through customizing the fit and by using materials that are soft and mold to the foot by using a costumed designed cutout in the heel pad to offer localized pain relief. I wanted to conduct this study as plantar fasciitis is a common problem and no local study is available that shows efficacy of this treatment option in our local population.

MATERIALS AND METHODS

This was a quasi-experimental study conducted from January 2017 to July 2017, in the Department of Rehabilitation Medicine, Saidu Group of Teaching Hospital Swat. By purposive non-probability sampling technique, sample size of 60 patients was calculated with 95% confidence, d=1 and taking mean reduction in pain score i.e. 4.17±1.92 after treatment with heel pad in patients of planter fasciitis. Patients with age of 18 years or older with clinical diagnosis of plantar fasciitis characterized by a complaint of first-step pain and maximal tenderness over the medial calcaneal tuberosity for more than six weeks were included in the study. However, patients with history of previous heel surgery, alteration in feet, or use of heel pad orthoses during the six months period were excluded.

A visual analogue scale (VAS) was used to assess a base line pain score in each subject in the initial visit. Then after 5 weeks of follow up the reduction in pain score was recorded and the difference was seen. The VAS used in the study consisted of a continuous horizontal line 10 cm in length with anchor points of “no pain” (0) and “worst pain” (10) on the left and right ends of line respectively.

Statistical analysis of data was done using statistical software i.e. SPSS ver. 10.0. Quantitative variables like age and pain score before and after treatment are presented in the form of mean±S.D. Qualitative variables like gender & pain relief are measured in the form of frequency and percentages. Mean reduction in pain score was calculated by subtracting pain score after treatment from baseline pain score.

RESULTS

In this study, 60 patients of plantar fasciitis were recruited according to the calculated sample size. The mean age of all the patients was 38.73±11.72 years. The minimum age was 19 years and maximum age was 70 years.

There were more female patients [36(60%)] presented with plantar fasciitis as compared to male patients [24(40%)]. In this study, Male-to-female ratio was 1:1.5.

The mean age of male patients was 33.83±11.26 years with minimum and maximum age as 19 years and 59 years, respectively. However, the mean age of female patients was 42±10.99 years with minimum and maximum age as 22 years and 70 years, respectively (Table 1).

Furthermore, Table 02 shows pain as the outcome variable that was measured through VAS. Baseline pain score of all patients was observed as 10. This pain score was reduced by some points by using heel pads after 5 weeks of follow-up. The mean pain score after 5 weeks of all patients was observed as 1.67±2.75. Minimum score was 0 and maximum score was 8. The mean reduction in pain score was 8.33±2.75. This was a significant reduction in pain score after 5 weeks follow-up (p-value = 0.000).

		Male	Female	Total
Age (years)	N	24	36	60
	Mean	33.83	42	38.73
	SD	11.26	10.99	11.72
	Min	19	22	19
	Max	59	70	70
	Range	40	48	51

Table 2 Reduction of pain score from baseline to follow-up visit

		Baseline pain score	Pain score after 5 weeks	Difference
Effects of Heel pads	N	60	60	60
	Mean	10	1.67	8.33
	SD	0	2.75	2.75
	Min	10	0	2
	Max	10	8	10
	Range	0	8	8

Test value = 23.5 p-value = 0.000*

DISCUSSION

Plantar fasciitis accounts for an estimated one million visits per year to the doctor in the United States and makes up approximately 25% of all foot injuries in runners. Although the majority of the cases resolve within 10 months, 10% develop chronic plantar fasciitis. The pathomechanics of plantar fasciitis is assumed to be due to excessive tensile loading, exacerbated by abnormal biomechanics of the.[10-14]

Plantar fasciitis, reportedly is the most common cause of pain in the inferior heel, is estimated to account for 11%-15% of all foot symptoms requiring professional care among adults.[20, 23] Treatment includes rest, anti-inflammatory medication, shoe inserts, night splints, stretching, iontophoresis, corticosteroid injections, extracorporeal shockwave therapy and surgery. There is no evidence that any specific mode of treatment is particularly effective.[15]

Foot orthoses are frequently utilized as a component of the conservative management plan for plantar fasciitis. Pain relief, comfort, support, shock absorption, and affordability are key criteria for heel pads and orthotics, particularly for the older adult population.[16]

60 patients with the mean age of all the patients were 38.73±11.72 years were reported with plantar fasciitis. There were 60% female with mean age of 42±10.99 years and 40% male with mean age of 33.83±11.26 years. Male-to-female ratio was 1:1.5. Gender difference is not the issue of this study. Different studies have shown different male to female ratio.[16-19]

The purpose of this study was to determine changes in pain, that was VAS=10 of all patients at baseline visit, after use of heel pad. So patients were followed-up till 5 weeks after application of heel pads and mean pain score of 1.67±2.75 was observed. The mean reduction in pain score from baseline till final follow-up was 8.33±2.75. This was a significant reduction in pain score after 5 weeks follow-up (p-value = 0.000). Seligman et al., recorded baseline VAS score as 5.70±1.95 which was reduced to 1.85±1.13 after 5 weeks. The mean reduction observed in pain score was 4.17±1.92. A highly significant difference in pre-post scoreswas observed. [16]

Pfeiffer et al. conducted a randomized multicenter trial involving 236 patients diagnosed with plantar fasciitis recruited from 15 orthopedic foot and ankle clinics. 5 different treatments were compared. Patients were followed for an 8-week period and they used the pain subscale of the Foot Function Index (FFI) as their outcome measure. They reported that groups treated with the prefabricated inserts had significantly better outcomes than other groups. The percentages of patients whose condition had improved at 8 weeks was 81% for a rubber heel cup.[20]

But Martin et al. evaluated custom foot orthoses in comparison to prefabricated arch supports and night splints in 255 patients with plantar fasciitis. Patients in the prefabricated orthoses group and the night splint group had the poorest compliance rates and the highest number of patients withdrawn, with 21% and 26% respectively. There was no significant difference in pain reduction in all groups.[21] Landorf agreed with these results.[3]

Ferber also concluded that that semi-custom molded orthoses reduce plantar fascia strain compared to walking without an orthoses. However, this particular device does not control peak rear foot eversion, tibial internal rotation, or arch deformation.[22]

CONCLUSION

Heel pain associated with plantar fasciitis can be extremely debilitating. Expedient treatment of this pain is critical to maintaining optimal levels of functioning. We have described a heel pad that effectively manages this pain, is quick and easy to make, and is affordable. Pain relief and comfort are achieved through customizing the fit and by using materials that are soft and mold to the foot by using a costumed designed cutout in the heel pad to offer localized pain relief. This device meets the criteria of comfort, support, and cost, all paramount in designing an orthotic to meet the needs of our aging population. This device should be considered as a first line of treatment for older persons with plantar fasciitis.

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