ORIGINAL ARTICLE

Treatment of Plantar Fasciitis of Foot- Local Steroid Infiltration in Comparison with Conventional Treatment- A Randomized Controlled Trial

IMRAN KHAN WAZIR, MUHAMMAD INAM, MUHAMMAD ARIF, M SAEED, ABDUL SATAR

ABSTRACT

Objective: To determine the effectiveness of local steroid injections in the management of plantar fasciitis in comparison with conventional treatment with analgesics.

Material and Method: This prospective hospital based randomized control study was conducted in the Department of Orthopedics and Spine Surgery, Post Graduate Medical Institute, Hayatabad Medical Complex, Peshawar from July 2010 to January 2011 on 52 patient of either sex. The patients were divided into two treatment groups. After assigning the subjects randomly between the groups by lottery method, treatment was applied and pain was noted at 1st, 3rd and 5th week after treatment.

Results: The study was conducted on 52 patients of plantar fasciitis. In which male to female ratio was 1:1.73. Average age was 44.11 years± 9.76SD. Majority of patients were at the age group of 31-45 years. Pain at 1st, 3rd and 5th week was significant in both the groups with p-value 0.000, 0.000 and 0.000 respectively.

Conclusion: Local steroid injection along with conventional treatment is better than conventional treatment.

Key word: Steroid, Plantar Fasciitis, Calcaneum, Tenderness

INTRODUCTION

Plantar fasciitis is a common foot problem. It affects approximately 2 million people annually and affects as much as 10- 15% of the population over the course of a lifetime[1,2].

Plantar fasciitis is characterized by a sharp, stabbing and burning pain in the posteromedial aspect of the heel. Plantar fasciitis is thought to be the result of irritation of fascia at its origin[3]. The function of plantar fascia is to provide static support for the longitudinal arch of foot and to assist with dynamic shock absorption during foot plantar strike[4]. Repeated micro trauma in the plantar fascia at its origin results in chronic inflammatory changes. This study is conducted to determine the effectiveness of local steroid injections with conventional treatment in the management of plantar fasciitis in comparison with conventional treatment alone.

Correspondence: Dr Muhammad Inam, Department of Orthopedic and Spine Surgery PGMI Hayatabad Medical Complex Peshawar.
Email: dr_mohammadinam@yahoo.co.uk

MATERIALS AND METHODS

This prospective hospital based randomized control study was conducted in the Department of Orthopeadics and Spine Surgery, Post Graduate Medical Institute, Hayatabad Medical Complex, Peshawar from July 2010 to January 2011, on 52 patients of either sex. Patients were selected according to the following inclusion and exclusion criterion.

Inclusion Criteria

- Patients between age group 20-70 years
- Base line pain score more than 0.
- Either sex

Exclusion Criteria

- Any bleeding disorder (Risk of hematoma formation after injections)
- Any dermatological disease such as eczema or psoriasis around the foot and ankle (results of plantar fasciitis treatment cannot be assessed in these Pakistan).
- Septic arthritis of foot and ankle joint (results of plantar fasciitis treatment cannot be assessed)
- Rheumatoid arthritis and gout (risk of infection is high)

- Diabetic foot (risk of infection is high and pain cannot be evaluated in presence of neuropathy)
- Tumors (steroid injection contraindicated)
- Patient with recent history of foot trauma (results of plantar fasciitis treatment cannot be assessed)

All the patients visiting orthopedics outpatient department of Hayatabad Medical Complex with heel pain and fulfilling the inclusion criteria were included in the study. Written informed consent was obtained from all patients and patient, were informed that data so collected will be used for medical research purposes only and patients were assured regarding strict confidentiality of information. Patients were randomly allocated in two groups A or B by lottery method. Patients age, sex occupation and address were entered in Performa. Patients in Group A (controlled group) was managed only by conventional treatment(i.e. Ibuprofen 400 mg three times a day and exercises) and the patients in Group B were given local steroid injection i.e Methylprednisolone (Inj Depo Medrol 40 mg) (Group B). The observer bias was addressed by blinding of observer recording Visual Analogue Score (VAS) to treatment arm. Under strict aseptic conditions injection Depo Medrol 40 mg and ICC injection Lignocain 2% was infiltrated at site of maximum tenderness under aseptic technique. Aseptic dressing was applied afterwards. One session of infiltration of injection was given only. Visual Analogue Scale was used to describe the pain relief on weight bearing. The range of VAS of 1 to 4, 5 to 7 and 8 to 10 were considered as mild, moderate and severe respectively. VAS was recorded on 1st, 3rd and 5th week post treatment. SPSS software version 11 was used to analyze data. Mean ± S.D was calculated for age, physiotherapy session undertaken. Frequencies and percentages were presented for gender, occupation, pain on weight bearing. Chi-Square test was used to compare Group A (controlled group) and Group B (interventional group) for the pain relief on weight bearing. P value ≤ 0.05 was considered statistically significant for the two groups. All the results were presented as tables and graphs.

RESULTS

A total of 52 patients were observed, who were divided in two equal groups A & B. Patients in Group A (controlled group) were managed only by conventional treatment (i.e. Ibuprofen 400 mg three times a day and exercises) and the patients in Group B were given local steroid injection i.e methylprednisolone (Inj Depo Medrol 40 mg) and 2% xylocamine ICC.

Gender distribution shows that out of 26 patients 10(38.5%) were male and 16(61.5%) were female while in group B 9(34.6%) were male and 17(65.4%) were female. Male to female ratio was 1:1.73. Gender distribution among the groups was insignificant with p-value=0.500. (Table 1).

Average age was 44.11 years± 9.76SD with range in 18-58 years. Group A had 10(38.5%) patients in 18-30 years, 13(50%) patients 31-45 years and 3(11.5%) patients were between the ages of more than 45 years.

Table 1: Sex wise Comparison of both the Groups

		Group		Total	P-value
		A	B		
Sex	**Male**	10 38.5%	9 34.6%	19 36.5%	0.5000
	Female	16 61.5%	17 65.4%	33 63.5%	
Total		26 100.0%	26 100.0%	52 100.0%	

Table 2: Age wise Distribution in Both the Groups

		Group			
		A	**B**	**Total**	
Age(in years)	**18-30**	3	4	7	0.699
		11.5%	15.4%	13.5%	
	31-45	13	10	23	
		50.0%	38.5%	44.2%	
	> 45	10	12	22	
		38.5%	46.2%	42.3%	
Total		**26**	**26**	**52**	
		100.0%	**100.0%**	**100.0%**	

Table 3: Occupation wise Distribution of Patients in both the Groups

		Group		Total	P-value
		A	**B**		
Occupation	**House Wife**	9 34.6%	12 46.2%	21 40.4%	0.324
	Govt. Servant	6 23.1%	8 30.8%	14 26.9%	
	Student	5 19.2%	1 3.8%	6 11.5%	
	Labor	6 23.1%	5 19.2%	11 21.2%	
Total		26 100.0%	26 100.0%	52 100.0%	

Table 4: Pain at 1st week in both the Groups

		Group		Total	P-value
		A	**B**		
Pain at Ist week	**Mild**		12 46.2%	12 23.1%	0.000
	Moderate	10 38.5%	13 50.0%	23 44.2%	
	Sever	16 61.5%	1 3.8%	17 32.7%	
Total		26 100.0%	26 100.0%	52 100.0%	

Table 5: Pain at 3rd week In both the Groups

		Group		Total	P-value
		A	B		
Pain at 3rd Week	**Mild**	2 7.7%	25 96.2%	27 51.9%	0.000
	Moderate	14 53.8%	1 3.8%	15 28.8%	
	Sever	10 38.5%		10 19.2%	
Total		26 100.0%	26 100.0%	52 100.0%	

Table 6: Pain after 5th week in both the Groups

		Group		Total	P-value
		A	B		
Pain at 5th Week	**Mild**	7 26.9%	25 96.2%	32 61.5%	0.000
	Moderate	16 61.5%	1 3.8%	17 32.7%	
	Sever	3 11.5%		3 5.8%	
Total		26 100.0%	26 100.0%	52 100.0%	

While group B contains 12(46.2%) patients in 18-30 years, 10(50%) in 31-45 years and 4(15.4%) patients had age more than 45 years. The age distribution among the groups was also insignificant with p-value 0.699. (Table 2)

Occupation wise distribution was also insignificant with p-value = 0.324. Majority of the patients were house wives. Group A had 9(34.6%) house wives, 6(23.1%) Govt Servants, 5(19.2%) students and 6(23.1%) were labors. While on other hand group B had, 12(46.2%) house wives, 8(30.8%) public servant, 1(3.8%) student and 5(19.2%) were labor. Occupation was compared in both the groups which showed insignificance with p-value=0.324. Table 3.

After one week, Majority of the patients 16(61.5%) had severe pain, 10(38.5%) a moderate pain while no patient had mild pain. In contrast to group A, majority of the patients in Group B had mild pain in 12(46.2%), 13(50%) had moderate pain and only 1(3.8%) had severe pain. This shows that the pain was highly significant with p-value 0.000. (Table 4)

When pain was observed after 3rd weeks, group A contains 10(38.5%) patients who have still had sever pain, 14(53.8%) patients had moderate and 2 (7.7%) had mild pain. While in both the groups only one patient had moderate and the rest of 25(96.2) patients had mild pain. Group A had significantly high pain as compared to Group B with p-value=0.000. (Table 5)

Finally at 5th week When pain was observed, in group A was reduced the severe pain to 3(11.5%) patients, 16(61.5%) patients had moderate and 7 (26.9%) had mild pain. While in groups B the same results were seen as recorded at 3rd week. But still the pain was significantly higher in group A as

compared to Group B with p-value=0.000. (Table 6)

DISSCUSSION

Plantar fasciitis is one of the most common conditions affecting the foot and has been reported to account for 15% of all adult foot complaints requiring professional care.[5] It is usually observed in the 40 to 60 year old age group, but has been reported in people from 7 to 85 years and appears to be more common in females.[6] the results are almost same to our study, in which females are 63.5% as compared to male of 36.5%.

Most of the international studies have been carried out in literate communities with good compliance of the patients, while we faced certain problems during this study. Many patients reporting to us had already taken multiple types of medication by themselves and most were from low socioeconomic and illiterate class.[5]

Prolonged standing is often cited as a causative factor for Plantar fasciitis,[7] based on the theory that prolonged tensile loading of the plantar fascia predisposes individuals to the condition.[8] There is no data to indicate what activities are commonly performed whilst standing and therefore the nature of the stresses placed on the lower limb[9]. This study was the first to examine prolonged standing in detail, using the Occupational Rating Scale to quantify the stresses placed on the heel and show that house wife and labour have more heel pain as those of government servants and students.[8] while in our study this factor was kept constant in both the groups to control the confounder. That is why occupation was insignificant in both the groups.

Conservative treatment had shown a wide range of acceptable outcome with success rates ranging from 46% to 100%.[10] However, 20% to 30% of patients treated with traditional measures progress to a chronic condition[11].Once the condition becomes chronic, response to any form of treatment becomes less predictable. Recovery from treatment for chronic plantar fasciitis tends to be lengthy and recurrance is common.

One of the study shows[11] that the combination of two modalities i.e conventional and local steroid application is effective in treating this painful condition of plantar fasciitis of foot and these results match with the study done by Nuefeld SK et al.[12] He showed that in his experience, nonsurgical treatment of plantar fasciitis by using these modes of treatment had success rate of 90% which is comparable to our results which are almost 93% at 5th week of treatment.

Nuefeld SK and Rebecca Cerrito emphasize that 90% of the patients of plantar fasciitis of foot respond to non surgical modes of treatment like local steroid injection, nonsteroidal anti-inflammatory drugs and conservative treatment. We have the same outcome in our patients by using these treatment modalities[12].

Activity modification and stretching can be effective in up to 70% of people. The results of a recent multicenter study supported by the American Orthopedic Foot and Ankle Society (AOFAS) confirms this finding. In this prospective, randomized, blinded study[13] of 236 patients with isolated heel pain syndrome, 72% improved over the 8 week study period with stretching alone. This number increased to 88% with a simple off the shelf heel insert.

Adjunctive treatments include plantar fascial night splints, visco-elastic heel cups and Non-steroidal anti inflammatory drugs for initial management. Plantar fascia night splints, advocated by Wapner and colleagues,[14] support the ankle at five degrees of dorsiflexion when the patient is recumbent. This serves to keep the plantar fascia lengthened at night and serves to break the cycle of repetitive tearing of the soft tissues.

For recalcitrant cases, taping, corticosteroid injections and casting of the foot may be necessary. Casting releases the tension applied to the plantar fascia while weight bearing, and has been reported effective in over 50% of patients who might otherwise be candidates for surgical intervention.[15] Studies have indicated that corticosteroid therapy is effective in 35% to 77% of cases; however, the results are often temporary. Reported complications with steroid injections include plantar fascia rupture and heel pad atrophy .[16]

CONCLUSION

This study shows that majority of patients were female and house wives. Middle age is more exposed to the plantar fasciitis. This trial provides high quality evidence for the pharmacological effect of injection Depomedrol 40 mg along with conventional treatment in the management of plantar fasciitis. Furthermore, within the parameters of this protocol, the trial findings will be used to make evidence based recommendations

regarding the use of the said injection for treatment of this painful condition.

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