Original Article

Comparison of Autologous Blood and Steroid Injection in Patients with Plantar Fasciitis

Amanul Haq[1], Inayat ur Rehman[2], Israr Ahmed[2] and Tufail Ahmad[3]

ABSTRACT

Objective: To compare the effectiveness of autologous blood injection and steroid injection in patient with planter fasciitis.

Study Design: Randomized Controlled trial study.

Place and Duration of Study: This study was conducted at the Orthopedics department of Trauma unit, Khyber Teaching Hospital, Peshawar for a period of 9 months from July, 2012 to March, 2013.

Materials and Methods: 43 patients with Planter Fasciitis of more than 6 weeks duration with moderate to severe pain were consecutively allocated in each Group A (autologous blood) and B (steroid injection). Patients were assessed at 6 weeks follow up for effectiveness in terms of improvement in at least one grade of pain on Visual Analogue Scale. Data was analyzed with SPSS 10.0 & presented in from of tables and graphs.

Result: There were 22 (51.2%) & 18 (41.9%) males and 21 (48.8%) &25 (58.1%) females in Groups A and B respectively (P=0.517). Effectiveness was in 25 (58.10%) and 31 (72.10%) in group A and B respectively (P=0.429). Mean age in group A and B were 37.37 years± 7.77 SD and 38.93 years± 6.80 SD respectively (P=0.396). Effectiveness according to age (P=0.410), gender (P=0.417), baseline grade of pain (P= 0.542) and duration of symptoms (P=0.757) were insignificant.

Conclusion: Autologous blood injections are not more effective than steroid injections in patients with planter fasciitis.

Key Words: Autologous blood injection; Steroid injection; Effectiveness; Plantar fasciitis.

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INTRODUCTION

Plantar fasciitis is the most common presenting cause of chronic heel pain.(1) About 10% population complain of heel pain in some part of their life.(1, 2) About 2 million people are affected per year in United States. It is among the top five causes of ankle and foot pain in runners and in professional football, basketball and baseball players. Incidence of plantar fasciitis peaks in people between the ages of 40-60 years.

There are various treatmen modalities for plantar fasciitis including conservative & surgical.Conservative treatment like Non-Steroidal Anti-inflammatory drugs, foot orthosis, stretching exercises, extra corporeal shock wave laser therapy, local steroid injections, autologous blood & blood product injections.(3) It is the mainstay of management & is successful in 80-90% of cases. Steroid injections are considered as first line treatment for most patients with plantar fasciitis. 80% of the patients recover spontaneously. But where the symptoms persist various treatment options are available such as interventional and surgical options. Conservative measures include Foot orthosis, extra corporeal shockwave laser therapy stretching exercises analgesic.(4) Interventional measures used are local steroid injection, autologous blood and blood product injections. The most common interventional treatment of Plantar fasciitis used is the corticosteroid injection. This treatment has been supported by various studies showing its efficacy in immediate pain relief.(5) Autologous blood injection contains bioactive growth factors which can result in tissue regeneration and healing of the plantar fascia and pain relief, has also showed promising results in management of chronic tendon disorders.(6)

The rationale of the study was that it will help us to identify the course of management of planter fasciitis in our population as literature suggested steroid injection effective at one place and autologous injection effective in other studies. Autologous blood provides growth factors locally and is more cost effective. The study results will be disseminated to other health

1. Jinnah Medical College, Peshawar.
2. LRH Peshawar
3. Kuwait Teaching Hospital, Peshawar

Correspondence: Dr. Amanul Haq, Senior Registrar, Jinnah Medical College Peshawar.
Contact No: 0342-7199941
Email: dramanulhaq@gmail.com

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professionals & suggestions are given regarding modification in current management principles of patients with planter fasciitis according to the results of the present study.

MATERIALS AND METHODS

The randomized controlled trial was conducted from 01-07-2012 to 31-03-2013 in the Orthopedics department of Trauma unit, Khyber Teaching Hospital, Peshawar. It was after obtaining permission from the Institutional Board of the hospital. Informed written consent was obtained from patients. 43 sample size was calculated in each group using success rate of autologous blood injection to be 48% and success rate of steroid injection to be 78%, 95% confidence interval and 90% power of the test, under WHO sample size calculations.

All patients with both genders presenting with age 20-50 years and diagnosed with Planter fasciitis of more than 6 weeks duration with moderate to severe pain were included from the study. Patients with prior surgery of heel, dislocation of ankle joint, planter fascia rupture, calcaneal fractures and fractures of tarsal and metatarsal bones were excluded by past medical/surgical History and clinical record. Bilateral planter fasciitis because the response of treatment can't be graded accurately. Patients who had received steroid or autologous blood injections with in three months evident by history & clinical record. Patient with history of anemia, (Hemoglobin less than 7 grams %), thrombocytopenia (platelets count less than 150 x 10^3 per micro liter), or bleeding disorders were excluded by doing full blood count and known clinical record were excluded from the study.

Patients were randomly allocated in two groups by lottery method; Group A & B received autologous blood & steroid injection respectively under supervision of a fellow of CPSP. A detailed history was taken followed by detailed physical and systemic examination. In Group A, 2 ml of venous blood was taken from the right or left forearm cubital vein, mixed with 1 ml of xylocaine 2% and was injected into the maximum tender point of heel at the medial side under aseptic condition. In Group B, 2 ml of Xylocaine 2% was mixed with 1 ml of Injection Depo Medrol containing 40 mg of Methylprednisolone Acetate and was injected into the maximum tender point of heel medial side under aseptic condition. After injection the patients of both groups were kept for 15 minutes under observation in the OPD for hemodynamic stability and then the patient was allowed to go to home. Patients were instructed to avoid weight bearing for 48 hours and then wear soft shoes. Follow up patients were assessed at 6 weeks to determine the intervention effectiveness in terms of improvement in at least one grade of pain on visual Analogue scale. All the above mentioned information including name, age, sex, address was recorded in a predesigned proforma.

Data was entered in SPSS 21. Age, duration of planter fasciitis pain was presented ad mean & standard deviation. Categorical data like gender, affected side and effectiveness were presented as frequencies & percentage. Effectiveness was stratified among age, gender, baseline grade of pain and duration of heel pain to see the effect modification. The results were presented as tables and graphs. Chi square test was used to compare the effectiveness in the both groups while keeping p value of < 0.05 as significant.

RESULTS

In our study, total 43 patients were included. The patients mean age with plantar fasciitis in group A & group B were 36.86 years$\pm$7.10 SD & 38.28 years$\pm$7.87 SD for male and 37.90 years $\pm$8.57 SD and 39.40 years$\pm$6.04 SD for female respectively. In Group A (autologous blood injection), there were 22 (51.2%) males & 21 (48.8%) females. In Group B (steroid injection), there were 18 (41.9%) males and 25 (58.1%) females. Two patients in group A and one patient in group B were lost in follow up. P value equals 0.516 and it is considered to be statistically insignificant. Table:1

Side distribution in patients with plantar fasciitis in group A & in group B were right side 28 (65.10%) and 22 (51.2%) and left side 15 (34.90%) and 21 (48.8%). P value is 0.274 which is insignificant. Autologous blood injection (group A) & steroid injection (group B) were effective in 25 (58.10%) and 31 (72.10%) respectively while they were ineffective in 16 (37.20%) and 11 (25.60%) respectively. 2 (4.7%) and 1 (2.3%) were missing in group A and group B respectively. P value in between both groups is 0.429 which is also insignificant. Table: 1

The patients mean age with plantar fasciitis in group A & group B were 36.86 years $\pm$7.10 & 38.28 years $\pm$7.85 for male & 37.91 years $\pm$8.56 SD and 39.40 years $\pm$6.04 SD for female. P value was insignificant 0.39. Mean duration of symptoms in patients fasciitis in (group A) and (groupB) as shown in Table: 2

Frequency of age groups in patients with plantar fasciitis in group A and group B were respectively 21 to 30 years were 10 (24.39%) and 5 (11.90%) and 31 to 40 years were 15 (36.58%) and 14 (33.33%) and 41 to 50 years were 16 (39.02%) and 23 (54.76%) P value is 0.235 & is insignificant statistically. Frequency of duration of symptoms in patients with plantar fasciitis autologous blood injection (group A) and steroid injection (group B) as shown in Table:3. Frequency of s 0.584 which is insignificant statistically.

Frequency of baseline grade of pain in patients with plantar fasciitis in group A & group B were respectively; moderate was 33 (75.60%) and 30 (71.42%) and severe were 10 (24.39%) and 13

(28.57%). P value is 0.627 & is insignificant. Age wise effectiveness in autologous blood injection (group A) & steroid injection (group B) respectively were; in 21 to 30 years old patients were 7 (28%) and 4 (12.90%), in 31 to 40 years old patients were 7 (28%) and 10 (32.25%) and in 41 to 50 years old patients were 11 (44%) and 17 (54.83%). P value is 0.410 which is insignificant. Gender wise effectiveness in both groups as shown in Table: 4 Effectiveness regarding baseline grade of pain in both group A & B respectively were; 20(80%) and 22 (70.96%) in moderate pain patients and 5 (20%) and 9 (29.03%) in severe pain patients. P value is 0.542 which is insignificant statistically. Effectiveness regarding duration of symptoms in patients with plantar fasciitis in group A & group B as shown in Table: 4. P value is 0.757 which is insignificant statistically.

Table No.1: Gender, Side& Effectiveness distribution of patients in Autologous blood injection (Group A) & steroid injection (Group B) in patients with planter fasciitis

	Group A (Autologous Blood Injection)		Group B (Steroid Injection)		P value
Distribution of Gender among patients	Male	Female	Male	Female	
	22(51.205)	21(48.80%)	18(41.90%)	25(58.10%)	0.57
Side Distribution among patients	Right	Left	Right	Left	
	28(65.105)	15(34.90%)	22(51.20%)	21(48.80%)	0.274
Effectiveness of planter fasciitis patients	Effective	Non-effective	Effective	Non-effective	0.42
	25(58.10%)	16(37.20%)	31(72.10%)	11(25.60%)	

Table No.2: Mean Age and Duration of symptoms in Autologous blood injection group (Group A) & steroid injection group (Group B) in patients with planter fasciitis

	Group A (Autologous blood injection)		Group B (Steroid Injection)	
Mean age of patients with planter fasciitis	Male	Female	Male	Female
	38.86 ± 7.10	37.90± 8.57	38.28±7.87	39.40±6.04
Duration of symptoms with planter fasciitis	2.36± 1.00 weeks	2.67± 1.97 weeks	2.56± 1.09 weeks	2.76± 1.16 weeks

Table No.3: Duration of years & duration of symptoms in Autologous blood injection group (Group A) & steroid injection group (Group B) in patients with planter fasciitis

		Group A	Group B	P value
Age Group	21-30 years	10(24.39%)	5(11.9%)	0.235
	31-40 years	15(36.5%)	14(33.3%)	
	41-50 years	16(39.02%)	23(54.7%)	
Duration of symptoms	>6 weeks	9(21.9%)	9(21.4%)	0.584
	>8 weeks	13(31.7%)	8(19.0%)	
	>10 weeks	9(21.9%)	12(28.5%)	
	>12 weeks	10(24.3%)	13(30.9%)	

Table No. 4: Effectiveness in different Age groups, Gender, Baseline grade of pain & duration of symptoms in Autologous blood injection group (Group A) & steroid injection group (Group B) in patients with planter fasciitis

		Group A	Group B	P value
Age Group	21-30 years	7(28%)	4(12.9%)	0410
	31-40 years	7(28%)	10(32.25%)	
	41-50 years	11(44%)	17(54.8%)	
Gender	Male	12(48%)	11(35.48%)	0.417
	Female	13(53%)	20(64.51%)	
Baseline Grade of pain	Moderate	20(80%)	22(70.96%)	0.54
	Severe	5(20%)	9(29.03%)	
Duration of symptoms	>6 weeks	4(16%)	7(22.5%)	0.75
	>8 weeks	9(36%)	7(22.5%)	
	>10 weeks	6(24%)	8((25.58%)	
	>12 weeks	6(24%)	9(29.03%)	

DISCUSSION

Plantar fasciitis is a common foot problem. Approximately it affects 2 million people yearly & affects as much as 11-15% of the population over the course of a lifetime. [7,8] Plantar fasciitis is a degenerative tissue condition that occurs near the site of origin of the plantar fascia at the medial tuberosity of the calcaneous. [9, 10] It is the most common presenting cause of chronic heel pain.(1)About 10% of population complains of heel pain in some part of their life. About

2 million people are affected per year in United States.[11]

Both gender are equally affected.[10] Usually it is observed in the 40-60 year age group, but has been reported in people from 7 to 85 years & appears to be common in females. In our study female predominance was observed.[12] However, age wise distribution is different in our study. Although all ages are affected by PF, in our study it was more common in the age group of 40-50 years. But the incidence increases between the ages of 40 and 60. Plantar fasciitis in group A and group B were also 41 to 50 years, 16 (39.02%) and 23 (54.76%) respectively. But regarding effectiveness of treatment, age and gender has no role. Zahid et al, results also similar in our study. [8]

Up to 20 % patients fail to respond to conservative treatment respond to conservative treatment.[13] But in our study ABI and CSI were ineffective in 16 (37.20%) and 11 (25.60%) respectively which are similar to those reported in another study (up to 30% failure rate of conservative treatment).[14]

In our study patients in both groups, with moderate grade of baseline pain showed increased effectiveness (70% to 80%) but literature searched has not mentioned whether baseline grade of pain affect outcome or not.

Pain is intense, sharp typically with first few steps in morning, aggravated by sprinting and jumping and walking bare foot. In addition to pain there may be stiffness in the foot and localized swelling in the heel. There is tenderness at the origin of or in proximal plantar fascia. Risk factors are intrinsic and extrinsic. Intrinsic risk factors include anatomical and functional, and degenerative.[11] Diagnosis can be made with reasonable certainty on basis of clinical assessment alone. 80% to 90% patients respond to conservative treatment. Conservative treatment modalities are orthosis, topical medications, oral non-steroidal anti-inflammatory drugs, heel cushions, physiotherapy, stretch exercises, local injections and extra corporal shockwave therapy and laser [15].

Local injections include steroids, autologous platelets and blood, botulinum toxin, hyperosmolar dextrose and lignocaine[1]. Surgical treatment is open or endoscopic release of plantar fascia. Complications are rupture of plantar fascia and atrophy of heel fat pad, soft tissue and skin. Autologous blood injection results in acute inflammatory response and reinitiating healing process. Complications include pain at injection site and infection.[2] Surgery is indicated when conservative treatment fails.[16]

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. They came from rural or some far flung areas and they didn't know anything about the nature of the disease. They were treated by the hakeems or by the traditional healers in the villages and small towns. Some of the patients were taking antibiotics for the treatment of plantar fasciitis.

In a study ABI were found 30% less effective than steroid injections (48% vs. 78%).[17] Lee et al, also reported less effectiveness of ABI than CSI (51% vs. 65%).[18] These results are comparable to our study in which autologous blood injections were effective in 25 (58.10%) and steroid injection were effective in 31 (72.10%).Other studies has reported that ABI and CSI are equally effective (68% and 65% respectively).[19]

CONCLUSION

The conclusion of the study that investigating the effect of two treatment modalities in term of pain in people with plantar fasciitis. It is possible that some aspects of the protocol will limit the extent to which findings can be generalized to routine clinical settings. Also the study shows that females are slightly more affected. Middle age is more exposed to the plantar fasciitis. Right and left sides are equally affected. Corticosteroids are slight more effective but the difference is insignificant. This trial will provide high quality evidence for the use of corticosteroids and autologous blood injections in the management of plantar fasciitis.

Author's Contribution:

Concept & Design of Study:	Amanul Haq
Drafting:	Inayat ur Rehman, Tufail Ahmad
Data Analysis:	Tufail Ahmad, Israr Ahmed
Revisiting Critically:	Amanul Haq, Inayat ur Rehman
Final Approval of version:	Amanul Haq

Conflict of Interest: The study has no conflict of interest to declare by any author.

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