

Mean Reduction in Pain Score in Patients of Plantar Fasciitis after Triamcinolone Injection in Comparison to Autologous Blood Injection

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Abstract

Background: To compare mean reduction in pain score in patients of plantar fasciitis treated with triamcinolone injection in comparison to autologous blood injection.

Methods: This randomized controlled trial included 100 patients with plantar fasciitis. Base line visual analogue score (VAS) was calculated for each patients. 50 patients received triamcinolone injection and 50 patients' received ABI. VAS was calculated 6 weeks after treatment. The mean reduction in VAS in both groups was compared (p-value < 0.05 was taken as significant).

Results: The mean base line pain on VAS score of the patients in triamcinolone group 7.63 ± 1.24 and in autologous blood injection group was 7.19 ± 1.78 . Statistically, there was no significant difference between the two groups. (p-value > 0.05). The mean of VAS score of the patients after treatment was in triamcinolone group was 2.74 ± 1.34 and in autologous blood injection group was 4.28 ± 2.08 . Statistically, there was significant difference between the two groups. (p-value < 0.05). The mean of reduction in VAS score of the patients after treatment was in triamcinolone group was 3.22 ± 1.79 and in autologous blood injection group was 1.93 ± 2.34 . Statistically, there was no significant difference between the two groups. (p-value > 0.05).

Conclusion: Both triamcinolone injection and autologous blood injection can reduce the pain score significantly among patients with plantar fasciitis. However, more reduction in pain score was seen in patients of plantar fasciitis treated with Triamcinolone injection as compared to autologous blood injection.

Key Words: Plantar fasciitis, Triamcinolone, Autologous blood injection

Introduction

Plantar fasciitis (PF) is associated with significant morbidity. The response of plantar fasciitis to any treatment is unpredictable. Autologous blood injection (ABI) may also reduce the pain. This study compared the outcome of intralesional autologous blood with corticosteroid injection for reduction in pain among patients with plantar fasciitis. Plantar fasciitis is a common cause of heel pain in adults. ¹It is estimated that more than 1 million patients seek treatment annually for this condition, with two-thirds going to their family physician. ² Plantar fasciitis is thought to be caused by biomechanical overuse from prolonged standing or running, thus creating microtears at the calcaneal entheses. ³

For the same reason its incidence is very high in athletes ^{4,5,6} which is explainable when considering the biomechanics of running. ^{7,8} Some experts have deemed this condition "plantar fasciosis," implying that its etiology is a more chronic degenerative process versus acute inflammation. ^{9,10}

It is a degenerative condition and thus is relieved when mild inflammatory process is created that leads to healing. ¹¹ The pain caused by inflammation of the insertion of the plantar fascia on the medial process of the calcaneal tuberosity. The pain may be substantial, resulting in the alteration of daily activities. Various terms have been used to describe plantar fasciitis, including jogger's heel, tennis heel, policeman's heel, and even gonorrheal heel. Although a misnomer, this condition is sometimes referred to as heel spurs by the general public. ^{2,10} The annual cost of treatments for plantar fasciitis is estimated to be between \$192 and \$376 million dollars. The etiology of this condition is multifactorial, and the condition can occur traumatically; however, most cases are from overuse stresses. ¹² Higher BMI levels are also associated with higher prevalence of plantar fasciitis and heel pain. ¹³ Typical presentation is sharp pain localized at the anterior aspect of the calcaneus. Plantar fasciitis is

often associated with a heel spur (exostosis); however, many asymptomatic individuals have bony heel spurs, whereas many patients with plantar fasciitis do not have a spur. ¹⁴ Plantar fasciitis can be a difficult problem to treat, with no panacea available. Fortunately, most patients with this condition eventually have satisfactory outcomes with nonsurgical treatment. Therefore, management of patient expectations minimizes frustration for both the patient and the provider. ¹⁵

Response of chronic plantar fasciitis to any treatment is unpredictable. ¹⁶ The condition is potentially self limiting and can respond to conservative treatment. ¹ Non-operative treatments include physical therapy, cushioned heel inserts, night splints, walking casts and anti-inflammatory medication and extracorporeal shock wave therapy (concentrated ultrasound energy) to insertion of plantar fascia in to calcaneal tuberosity. ¹⁷⁻²¹ If conservative treatment for chronic plantar fasciitis fails often a corticosteroid injection is given. ^{22,23} Corticosteroid injection is more efficacious and cost effective than extra corporeal shock wave therapy. ²⁴ Corticosteroid injections although helpful in the treatment of plantar fasciitis, appear to predispose to plantar fascia rupture. ¹⁶ Autologous blood might provide cellular and humoral mediators to induce healing in the area of degeneration. ¹⁶ It is efficacious in relieving pain and tenderness but corticosteroid injection is more superior in terms of speed and probably extent of improvement. ¹⁶ Refractory cases can be treated operatively with limited (medial one third) plantar fascia release. ^{20,25} Surgical treatment of plantar fasciitis is associated with potential complications. ¹

Patients and Methods

This randomized control trial was done at Department of Orthopaedic Surgery, DHQ Teaching hospital Rawalpindi From July, 2015 to June,2017. Patients (n=100) between ages of 20 to 60 years with heel pain more than 3 months and not relieved by conservative methods (pain killers, exercises, splintage) or having pain in heel with first step in the morning, with VAS pain score ≥ 4 were included in the study. Fifty patients received triamcinolone injection and 50 patients' received autologous blood injection (ABI). Patients with history of diabetes, diabetic foot, previous calcaneous fracture, rheumatoid arthritis, gout, and patients previously treated with some injection treatment were excluded from study. Clinical severity of plantar fasciitis was assessed as no pain, mild, moderate, severe and worse possible according to VAS

and then patient were randomly placed in groups(by lottery method) receiving 1 ml(40 mg) of triamcinolone injection and 1 ml of autologous blood injection. Both injections were given on the tenderest point on heel. VAS pain score was recorded before and after administration of injection. Mean reduction of pain score was recorded 6 weeks post-treatment.

Results

Mean age of the patients in triamcinolone group was 48.56 ± 8.75 years. The mean age of the patients in ABI group was 50.60 ± 6.66 years [range 31 - 59 years] (Table 1). In triamcinolone group, there were 25 (50%) were male patients and 25 (50%) female patients. The female to male ratio in this group was 1:1. In ABI groups, there were 21 (42%) male patients while 29 (58%) patients were female. The male to female ratio in this group was 1:1.38. The mean base line pain on VAS score of the patients in triamcinolone group 7.63 ± 1.24 and in autologous blood injection group was 7.19 ± 1.78 . Statistically, there was no significant difference between the two groups. (p-value > 0.05). The mean of VAS score of the patients after treatment was in triamcinolone group was 2.74 ± 1.34 and in autologous blood injection group was 4.28 ± 2.08 .

Table 1: Distribution of patients by age (n= 100)

Age (years)	Triamcinolone		Autologous blood injection	
	No.	%	No.	%
20 - 30	0	0	0	0
31 - 40	3	6	11	22
41 - 50	23	46	15	30
51- 60	24	48	24	48
Mean \pm SD	48.56 ± 8.75		50.60 ± 6.66	
Range	33 - 60		31 - 59	

Table 2: Distribution of patients by intensity of pain based on visual analogue score (VAS = 1 - 10)

	VAS score (base line)	VAS score (after treatment)	Difference (mean decrease)
Triamcinolone injection	7.63 ± 1.24	2.74 ± 1.34	3.22 ± 1.79
Autologous blood group	7.19 ± 1.78	4.28 ± 2.08	1.93 ± 2.34
p - value*	0.983	0.000	0.97

Statistically, there was significant difference between the two groups. (p-value < 0.05). The mean of reduction in VAS score of the patients after treatment was in triamcinolone group was 3.22 ± 1.79 and in ABI

group was 1.93 ± 2.34 . Statistically, there was no significant difference between the two groups. (p -value > 0.05) (Table 2).

Discussion

Plantar fasciitis is commonest cause of heel pain. Typically it presents with pain on first weight bearing step in morning and after prolonged period of sitting.²⁶

Its exact aetiology is multifactorial and most common is biomechanical stress to the plantar fascia at calcaneal tuberosity. Obesity, prolonged weight bearing, posterior muscle group tightness limited ankle joint dorsiflexion, walking and running maladaptive patterns all can produce biomechanical stresses. People with high levels of BMI are more prone to develop plantar fasciitis and reducing BMI improves the symptoms.²⁷

In present study, both ABI and triamcinolone injection showed a decrease in VAS score from base line VAS score, but a mean reduction in VAS score was more with triamcinolone injection as compared to autologous blood injection. In literature there are few other studies which have compared the outcome of ABI with triamcinolone and the results are variable with each other based on outcome parameters. In a case series of 16 patients with plantar fasciitis who were injected with autologous blood, the average pain severity scale decreased from 7.1 to 2.8. The average Nirschl activity staging scale decreased from 6.2 to 2.9. Ten of the 16 patients were able to resume strenuous activity, and of these 7 had no pain. Three patients reported no response to blood injection.²⁸

In a study by Lee TG, et al, patients with plantar fasciitis were treated either autologous blood injection (33 patients) or corticosteroid injection (31 patients).¹⁶ On comparison the mean base line of VAS 7.3 ± 1.8 was which reduced to 3.6 ± 2.6 in autologous blood injection group. As compared to mean baseline VAS in corticosteroid group was 6.9 ± 1.7 which reduced to 2.5 ± 3.0 in triamcinolone group. The results of this study showed an improvement in VAS score with both of these modalities but the VAS score with corticosteroid injection was more than that of autologous blood injection.

In another study by Kitter E, et al, the mean base line VAS score with autologous blood injection was 7.6 ± 1.3 which improved to 2.4 ± 1.8 (p -value < 0.001). Similarly, there was also improvement in corticosteroid group from 7.3 ± 1.2 to 2.6 ± 2.9 at six months follow up (p -value < 0.001).²⁸ They used methylprednisolone as corticosteroid agent which is less potent than triamcinolone.

When compared to shock-wave therapy, one recent study comparing corticosteroid injection with both extracorporeal shock-wave therapy and stretching only showed that corticosteroids produced a significant reduction in both pain and tenderness at 3 months, and the former was maintained for at least 12 months.²⁸

ABI has many advantages. Its application is minimally traumatic. It has a reduced risk for immune-mediated rejection. It is simple to acquire and administer and inexpensive with acceptable patient compliance.²⁹ Corticosteroid injections have been reported to carry a risk of complications such as fat pad atrophy, osteomyelitis of the calcaneus, and rupture of the plantar fascia.³⁰

Different pain scores have been utilized by various authors. Most of the authors have used VAS scores as an outcome parameters. This is simple and effective and can be performed easily in outdoor setting. TT score has been advocated by Lee TG, et al, and Tsai et al.^{16,31} A pressure algometer (Wagner Instruments, Greenwich, CT) was used to measure TT in a manner similar to that described by Tsai et al.³¹ The pressure algometer is a pressure gauge fitted with a 1-cm² area and is calibrated in kilograms per square centimeter. A Rearfoot score at baseline and 6-month follow-up has also been advocated by Kitter E, et al.²⁸

Conclusion

1. Both triamcinolone injection and autologous blood injection can reduce the pain score significantly among patients with plantar fasciitis.
2. More reduction in pain score was seen in patients of plantar fasciitis treated with Triamcinolone injection as compared to autologous blood injection.

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