



Efficacy and Role of Local Injection of Platelet Rich Plasma and Local Corticosteroid Injection in the Treatment of Plantar Fasciitis

KEYWORDS

Platelet Rich Plasma, Corticosteroid, Plantar Fasciitis

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ABSTRACT *Objective: To compare the efficacy and role of local corticosteroid injection and local injection of platelet rich plasma in the treatment of plantar fasciitis.*

Method: This article reports on prospective review of patients who had plantar fasciitis and were treated with PRP & corticosteroid. 60 patients were enrolled in this study of which 30 were given local PRP and other 30 were given corticosteroid and were followed at an interval of 2weeks, 4weeks, 6weeks and 3monthsof intervention for response of pain by "Visual Analogue Scale"

Results: The mean age among Group A was 42.13 ± 8.38 as compared to 42.03 ± 13.01 years of Group B. The difference between Visual Analogue Scale score for pain between two groups at 6 weeks ($p=0.02$) and 3 months ($p=0.02$) was found statistically significant.

Conclusion: Local injection of platelet rich plasma has effective role over local corticosteroid injection in the treatment of plantar fasciitis

INTRODUCTION

Plantar Fasciitis is a degenerative tissue condition that occurs near the site of origin of Plantar Fascia at the medial tuberosity of the calcaneus. In acute phases, Plantar Fasciitis is characterized by classical signs of inflammation including localized tenderness, pain, swelling and loss of function. Numerous methods have been advocated for treating Plantar Fasciitis but conservative treatment method is usually preferred as the initial treatment. The most preferred method of non-surgical treatment is the local Injection of Corticosteroids and are commonly used secondary to the conservative therapies in patients who have resistant Plantar Fasciitis. The use of Corticosteroids is particularly troubling as several studies have linked Plantar Fascia rupture to repeated use of local injections of Corticosteroids.

PRP is promoted as an ideal autologous biological blood derived product, which can be applied to various tissues where it releases high concentrations of Platelet Derived Growth Factors by its Alpha Granules, which possess multiple regenerative properties like wound healing, bone healing and also tendon healing. In addition PRP also possesses antimicrobial properties that may contribute to the prevention of infection. Complex interactions of these growth factors and differentiation factors along with adhesive protein factors such as Fibronectin are responsible for healing response, extracellular matrix formation, osteoid production, cell proliferation and removal of tissue debris.¹

Plantar fasciitis can be a difficult problem to treat. There is no evidence which strongly supports the effectiveness of any treatment for plantar fasciitis. Fortunately, most patients with this condition eventually have satisfactory outcomes with nonsurgical treatment. For patients who do not improve after initial or conservative treatment, Corticoster-

oid Injection (Methyl Prednisolone) may provide short-term benefit. However, these therapies do not improve long-term outcomes² and may cause plantar fascia rupture.

Among the emerging technologies, one investigational biological therapy, PRP has been recently explored in several clinical studies³; in particular, several controlled clinical studies have examined the effect of PRP in epicondylitis⁴.

Hence the present study was undertaken, to evaluate the "Efficacy and Role of Local Injection of Platelet Rich Plasma compared with Local Corticosteroid Injection for the treatment of Plantar Fasciitis"

Material and Methods:

The study was conducted on clinically confirmed and diagnosed cases of Plantar Fasciitis, who had been treated conservatively between Jan 2013 to June 2014 but had no response, were only involved in this study.

The Inclusion Criteria were all males and females coming to OPD, age above 18 years, presenting complaint of plantar heel pain worse on rising in the morning and/or after periods of sitting or lying, which have been present for longer than 6 weeks, on examination the site of maximal tenderness at the attachment of the plantar fascia on the medial tubercle of the calcaneus and failed conservative management of at least 4 weeks duration.

The Exclusion Criteria were the patient not willing for study, previously treated by surgery for plantar fasciitis, calcaneal fracture, regional pain syndrome, osteoarthritis, rheumatoid arthritis and peripheral vascular disease were excluded from the study.

A total sample size of 60 cases were involved in the study

and divided into two groups. First group of 30 cases (**GROUP - A**) was treated with local injection of PRP and Second group of 30 cases (**GROUP - B**) was treated with local injection of Corticosteroid. The 2ml of platelet rich plasma (PRP) was obtained using a single step centrifugation procedure and bench top centrifuge. Under aseptic precautions patients of Group A were infiltrated with an injection of 2 ml autologous PRP and 1 ml of 2% Lignocaine at the medial side of the calcaneum (**Figure I – Steps in Group-A**). Similarly, Group B Patients was infiltrated with 2 ml of local Corticosteroid (Methyl Prednisolone 40mg) mixed with 1ml of 2% Lignocaine at maximum tender point (**Figure II – Steps in Group-B**).

A repeated injection of PRP was given at 4th week.

All the patients were evaluated after 2weeks, 4weeks, 6weeks and 3 months of intervention for response of pain. Pain of the participants was assessed by most widely used and accepted "Visual Analogue Scale".

RESULTS:

Table 1: Age Distribution among Two Groups

Variable	Group A (n=30)	Group B (n=30)	t- value
Mean age (years)	42.13 ± 8.38	42.03 ± 13.01	1.31 (p=0.19)

In the above table no.1, mean age among Group A was 42.13± 8.38 as compared to 42.03± 13.01 years of Group B. The difference between mean ages among these groups was not statistically significant. (p=0.19)

Table 2: Sex Distribution among Two Groups

Sex	Group A (%)	Group B (%)
Male	08 (26.67%)	10 (33.33%)
Female	22 (73.33%)	20 (66.67%)
Total	30 (100%)	30 (100%)

(X²= 0.32, p=0.57 not significant)

The above table describes the sex distribution among the two groups. It was found that percentage of females in both groups i.e. Group A (73.33%) and Group B (66.67%) was higher. The difference between two groups was not statistically significant. (p=0.57)

Table 3: Distribution of Patients According To Pain before Injection

Variable	Group A (n=30)	Group B (n=30)	t- value
Pain Before Injection	9.33±0.79	9.57±0.62	1.31 (p=0.19)

The mean Visual Analogue Scale score pain score before injection was shown in above table. It was found that mean Visual Analogue Scale score for pain before injection of drug in Group A and Group B was 9.33±0.79 and 9.57±0.62 respectively. The difference between two groups was not statistically significant by unpaired t test. (p=1.00)

Table 4: Distribution According To Pain after Injection at Various Stages

Variable (Pain)	Group I (n=30)	Group II (n=30)	t- value
At 2 weeks	6.93 ± 1.44	6.93 ± 1.75	0.00 (p=1.00)
At 4 weeks	4.63 ± 1.64	5.23 ± 1.89	1.31 (p=0.19)
At 6 weeks	2.47 ± 1.77	3.87 ± 2.63	2.44 (p=0.02)*
At 3 months	1.26 ± 1.75	2.57 ± 2.49	2.36 (p=0.02)*

(* p< 0.05 statistically significant)

The above table describes mean Visual Analogue Scale score for pain after injection at various stages. The difference between two group was not statistically significant at 2 weeks (p=1.00) and 4 weeks (p=0.19). The difference between two group at 6 weeks (p=0.02) and 3 months (p=0.02) was statistically significant.

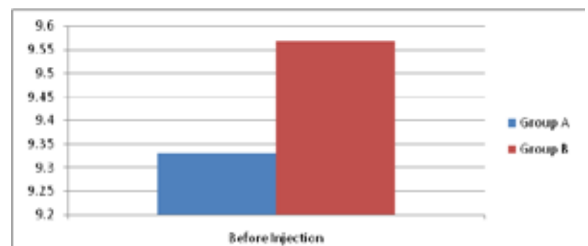


Chart 1: Distribution of Patients According To Pain before Injection



Chart 2: Distribution According To Pain after Injection at Various Stages

DISCUSSION:

The clinically confirmed and diagnosed cases of Plantar Fasciitis were included in the study. A total sample size of 60 cases were involved in the study and divided into two groups. First group of 30 cases (GROUP - A) was treated with local injection of PRP and Second group of 30 cases (GROUP - B) was treated with local injection of Corticosteroid.

All the patients were evaluated after 2weeks, 4weeks, 6weeks and 3 months of intervention for response of pain by "Visual Analogue Scale".

In the Table no.1, mean age among Group A was 42.13±8.38 years as compared to 42.03±13.01 years of Group B.

The Table no.2 describes the Sex distribution among the two groups. It was found that percentage of females in both groups i.e. Group A (73.33%) and Group B (66.67%) was higher. The difference between two groups was not significant.

The Table no. 3 shows that mean Visual Analogue Scale score for pain before injection of drug in Group A and Group B was 9.33±0.79 and 9.57±0.62 respectively. The difference between two groups was not significant

The Table no. 4 describes mean Visual Analogue Scale score for pain after injection at various stages. The difference between two group was not statistically significant at 2 weeks ($p=1.00$) and 4 weeks ($p=0.19$) but the difference between two group at 6 weeks ($p=0.02$) and 3 months ($p=0.02$) was statistically significant.

Similar results were found in a prospective study by Ragab *et al*⁵ (25 patients followed for 10 months) showed excellent results for pain (88% double improvement) and favorable functional progression (60%), which were associated with various favorable ultrasound changes (thickness and signal intensity of the plantar fascia) with PRP injections.

In contrary Aksahin *et al*⁶ did not observe significantly different outcomes after PRP or corticosteroid infiltration after 3 weeks and 6 months, respectively, in 60 patients (2 groups of 30 subjects) with plantar fasciitis refractory to conservative treatment.

PRP is a bioactive component of whole blood with platelet concentrations elevated above baseline and containing high levels of various growth factors.⁷ It is postulated that when transplanted into injured tissue, these platelet nests act as rally points for the modulation of collagen synthesis and tissue healing by releasing cytokines and chemoattractants.⁸ Early pain relief after PRP transplantation may

be due to an anti-inflammatory effect resulting from the inhibition of cyclooxygenase-2 enzymes by the cytokines provided by the platelets while later benefits may be due to local cellular proliferation, neoangiogenesis, and increased type 1 collagen production.^{9,10} Its ease of preparation, relatively low cost, and minimal invasiveness are arguments in its favour. Furthermore, PRP is not associated with any side effects.

The limitation of this study was the lack of a control group. And despite the limitations of our study, the protocol presented here could potentially be useful to inspire larger randomized clinical trials to determine PRP is effective for treating plantar fasciitis over corticosteroids.

CONCLUSION:

Based on the results of our present study it may be concluded that, autologous blood injection significantly reduced the pain based on VAS staging without any complications upto 3 months in patients with plantar fasciitis. Autologous blood is simple to acquire and prepare, easy to carry out. Hence autologous blood provides intermediate and long term results in term of pain relief in compared to corticosteroid injection which gives short term relief.

Abbreviations: PRP - Platelet Rich Plasma

FIGURE I – Steps in Group-A



FIGURE II – Steps in Group-B



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