



Orthopaedics

EFFECT OF PLATELET-RICH PLASMA VERSUS STEROID INJECTION IN PLANTAR FASCIITIS

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ABSTRACT **Background:** Plantar fasciitis (PF) is a common orthopaedic problem, with heel pain worsening the quality of life. Although steroid injection is often used if the conservative treatment fails, Platelet-Rich Plasma (PRP) injection is gaining popularity due to its safety and long-lasting effect. Therefore, this study aimed to assess the effect of PRP compared with steroid injection in the treatment of PF. **Methods:** This study was conducted in Opd of our Hospital. The patients we selected on random basis to compare the effect of PRP injection with steroid injection in plantar fasciitis in a period of 2 years. A total of 90 randomly selected participants aged 18 to 60 years suffering from plantar fasciitis with failed conservative treatment were intervened. The American Orthopaedic Foot and Ankle Society (AOFAS) and the Visual Analog Scale (VAS) scoring system were used to evaluate functional mobility and pain before and after the intervention for three and six months, respectively. **Results:** The PRP injection showed a better outcome than the steroid injection in six months follow-up. The mean ($\pm$ SD) VAS score was significantly decreased in the PRP group (1.97 ± 1.13) than in the steroid group (2.71 ± 0.94) with the group difference of -0.73 (95% CI: -1.18 to -0.28) at six months. Similarly, there was a significant increase in the AOFAS scores in the PRP group (86.04 ± 7.45) compared to the steroid group (81.23 ± 9.60) at six months of follow-up with a group difference of 4.80 (95% CI: 1.15 to 8.45). There was also a significant reduction of plantar fascia thickness in the PRP group compared to that of the steroid group (3.53 ± 0.81 versus 4.58 ± 1.02) at six months of follow-up with the group difference of -1.04 (95% CI: -1.44 to -0.65).

KEYWORDS :

INTRODUCTION:

Plantar fasciitis (PF), better termed as plantar fasciosis is a degeneration of plantar fascia leading to an inflammatory reaction^[1]. It occurs mostly due to the biomechanical stress on the plantar fascia^[2]. Plantar fascia lies in close connectivity to the para tendon of Achilles through the heel process. Therefore, any degenerative or inflammatory process within the para tendon of Achilles can hinder normal foot kinematics rendering plantar fascia thickness increment leading to plantar fasciitis^[3]. The PF worsens the quality of life with a lifetime global prevalence of 10%^[4], more common in females than males. The prevalence of plantar fasciitis is 59% in India among the age group of 40 to 50 years^[5]. Non-surgical treatments such as non-steroid anti-inflammatory drugs, shoe inserts, stretching exercises, or extracorporeal shockwave therapy are the first-line treatment of PF^[6], successful in up to 90% of cases and steroid as an injection therapy is traditionally practiced if non-operative treatment fails^[7]. A steroid injection may offer short-term relief, but it did not find long-term benefit in six months follow-ups. On the other hand, Platelet Rich Plasma (PRP) has strong anti-inflammatory properties with no adverse effects on the plantar fascia structure. It contains high levels of growth factors and anti-inflammatory cytokines, which potentially prevent infections, and enhance wound healing, bone healing, and tendon healing^[8]. Therefore, PRP has been a biological option in treating the PF. Nowadays, it has been a promising solution to many orthopaedic problems such as tendinopathies, non-union, and arthritis of the knee. The high cost of commercially available PRP kits demotivates the use of PRP therapy in most cases. A large portion of the population (between 63 and 72%) wears inappropriate footwear which leads to plantar fasciitis. Similarly, an intra-articular or soft tissue steroid injection may lead to different health comorbidities. On the other side, PRP treatment is less expensive, simple and minimally invasive in nature^[9]. It is safer and more beneficial than steroid injection in PF. Therefore, this study aimed to compare the effect of platelet-rich plasma injection with steroid injection for the treatment of plantar fasciitis in terms of pain, functional mobility and also the change of plantar fascia thickness.

METHODS:

Study Design And Setting:

This study was a hospital-based, open-label, randomized clinical trial to compare the effect of PRP injection with steroid injection in the treatment of Plantar fasciitis. The study was conducted in the OPD in Dept of Orthopaedics, ACPM Medical College, Dhule. The patients

aged 18 to 60 years with a history of heel pain of more than six weeks with tenderness on palpation over medial calcaneum tuberosity and diagnosed as PF, those patients with failure of conservative treatment with physiotherapy, splints, NSAIDs and those patients who provided written informed consent were included in the study. The patients with existing trauma, previous surgery or any foot pathology, under aspirin treatment and systemic diseases like diabetes and rheumatoid arthritis were excluded.

Intervention:

The patients diagnosed with plantar fasciitis by clinicians were randomized either into the steroid group or PRP group by the principal author and intervened by other research team members.

Steroid Group:

In the steroid group, 2ml of injection Depo-Medrol 80mg (Methylprednisolone) along with 1ml lignocaine (0.25%) were loaded in a 5-cc syringe. Then the cocktail was injected into the medial calcaneal tuberosity at the most tender point using an aseptic technique^[10].

Prp Group:

The 30 ml blood of participants was collected into an acid citrate dextrose tube under aseptic conditions and subjected to centrifugation at 2000 rpm (soft spin) through a digital centrifuge machine speed control. The upper two-thirds of the tube containing platelet-poor plasma was discarded, and the lower one-third of concentrated platelet plasma superficial buffy coat was injected into medial calcaneal tuberosity at the most tender point. All participants were counselled to follow up in the next visit at three months and six months.

RESULTS:

At baseline, a total of 90 participants were included in this study (45 participants in the PRP and 45 in the steroid group). However, after six months of follow-up, a total of 83 participants completed the study (41 participants in the PRP group and 42 participants in the steroid group), whereas three participants lost follow in the steroid group, and four participants discontinued the trial in the PRP group. The majority, 72 were female, and 11 were male. Most of the participants (58.9%) had the problem of plantar fasciitis on the right foot, and only 41.1% had the occurrence on the left side.

Comparison Of Vas, Aofas Score, And Plantar Fascia Thickness

For Patients Treated With Prp And Steroids

Variables	PRP treat- ed group (n = 45)	Steroid treated group (n = 42)	Between- group difference	p-value [†]
	Mean (SD)	Mean (SD)	(95% CI)	
VAS score				
At baseline	5.22 (1.34)	4.77 (0.95)	0.44 (-0.04 to 0.93)	0.073
At 3 months	4.22 (1.04)	3.14 (0.81)	1.07 (0.67 to 1.47)	<0.001*
At 6 months	1.97 (1.13)	2.71 (0.94)	-0.73 (-1.18 to -0.28)	0.001*
AOFAS score				
At baseline	52.53 (14.87)	58.14 (11.47)	-5.60 (-11.30 to 0.08)	0.005
At 3 months	63.80 (12.04)	75.76 (7.18)	-11.96 (-16.22 to -7.69)	<0.001*
At 6 months	86.04 (7.45)	81.23 (9.60)	4.80 (1.15 to 8.45)	0.011*
Plantar fascia thickness				
At baseline	5.56 (0.95)	5.69 (0.88)	-0.12 (-0.51 to 0.25)	0.507
At 6 months	3.53 (0.81)	4.58 (1.02)	-1.04 (-1.44 to -0.65)	<0.001*

[†]Student's two-sample t-test; *Statistically significant at p < 0.05

DISCUSSION:

The study aimed to compare the effect of PRP injection with steroid injection for the treatment of plantar fasciitis. This study shows that steroids had better results than PRP in three months, but in six months, PRP decreased the massive pain and had a more improved AOFAS score compared with steroids. The well-being of the participants, assessed in terms of pain and functional mobility, was found to be better in the steroid group at three months; however, long lasting relief from pain and higher mobility function was achieved at six months in the PRP group. Different systematic reviews have shown that steroid injection had a quick recovery in reducing the symptoms than PRP, which has a slower improvement but long-term permanent effect.

Yang et al., 2017 found that the PRP is better than steroid injection for long-term pain reduction in plantar fasciitis, but there was no noticeable observed field difference between short- and intermediate-term effects^[11].

Kalia et al., 2021 mention that steroid injection significantly reduces the plantar fascia thickness at one and three months than that of PRP but no difference in six months^[12].

McMillan et al., 2012 explore that steroid injection reduces abnormal swelling of plantar fascia for up to three months^[13]. Data reveals a 35.45% reduction in the thickness of plantar fascia in the PRP group and a 29.16% reduction in the corticosteroid group within six months of follow-up^[14].

Also, most of the patients with plantar fasciitis preferred conservative treatment over injection therapy which could not make the larger sample size to generalize the findings in a large population.

CONCLUSION:

The PRP injection showed better performance than the steroid injection for the treatment of plantar fasciitis in six months. To generate evidence comparing the efficacy of PRP to steroid injection for the treatment of plantar fasciitis, larger multi-centre trials with more than six months of follow-up are required.

No conflict of interest.

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