ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

Comparative Study of Corticosteroids v/s Platelet Rich Plasma for the Treatment of Plantar Fasciitis in a Teaching Hospital

[1]Dr Kamala G R, [2] Dr Hanumantharaya G H

[1]Department of Anesthesiology, District Hospital, Chitradurga, Karnataka, India
[2]Department of Orthopedics, District Hospital, Chitradurga, Karnataka, India

Corresponding Author:
Dr.Hanumantharaya G H

Abstract: The plantar heel pain is very common complaint that causes significant discomfort. Plantar fasciitis is due to degenerative change of the plantar fascia at attachment site. Corticosteroids and autologous PRP injections are effective in the treatment of plantar fasciitis. We compared the local corticosteroid (methyl prednisolone acetate) injection and platelet-rich-plasma in terms of patient outcome in chronic plantar fasciitis. **Materials and methods:** The study was conducted at Pain clinic and in Department of Orthopaedics, Government District hospital Chitradurga, Karnataka from November 2022 to October 2023. Forty patients were enrolled in this study. The patients were selected randomly and were divided in two groups of 20 patients each (PRP and Steroid groups). Follow up done at 2 weeks, 6 weeks, 3 months and 6 months. **Results:** Significant pain relief after 6 weeks of platelet rich plasma therapy and after at 3 months and 6 months follow up. Significant improvement in both groups with respect to AOFAS score and VAS scores. This improvement was significantly more in PRP group. **Conclusion:** PRP injection is more effective in resulting pain relief and function as compared to corticosteroid injection in the treatment of plantar fasciitis.

Keywords: Plantar Fasciitis, Corticosteroids, Platelet Rich Plasma, PRP, VAS, AOFAS score

Introduction: Plantar fasciitis is one of the most common causes of heel pain. Plantar fasciitis is caused by an inflammation of the plantar fascia due to tear in the fascia or repetitive micro trauma. It is commonly seen in the age range of 40 to 70 years. The prevalence of heel pain is 3.6% to 7% in the general population.[1] plantar fasciitis is common in athletes, obese individuals and people with tight tendo-achilles and improper footwear and on prolonged standing activities. It is worse at the first step in the morning and on getting up from sitting position or on long standing. Various treatment options include rest, NSAIDS, stretching protocols, foot orthotics, physiotherapy, corticosteroids and autologous PRP injection. Surgical management has been reserved for resistant cases. Almost 90% of patients get better with non-surgical treatment.[1, 2]

Corticosteroid injections have been used to treat heel pain since 1950s. Low cost, low complexity and rapid pain relief are the advantages of corticosteroids injection. Effects of

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

corticosteroid for plantar fasciitis patients showed improvement in symptoms at one month, but not for a long lasting effect. Repeated corticosteroids injections have been associated to plantar fascia rupture.[3]

The platelet-rich plasma (PRP) injections are now recently introduced and considered as an effective treatment for plantar fasciitis. The use of autologous PRP was first used in 1987 by Ferrari. It can be injected into tissues, where the platelets get activated and release high levels of transforming growth factor-beta (TGF-β), platelet-derived growth factors (PDGF), fibroblast growth factors (FGF), vascular endothelial growth factors (VEGF), and the cytokines at the injected site. These growth factors liberated by platelet-rich plasma promote the healing of wounds, tendons, and bones at the cellular level.[4, 5, 7] In this study; we compared the local corticosteroid (methyl prednisolone acetate) injection and platelet-rich-plasma in terms of patient outcome in chronic plantar fasciitis.

Materials and methods: The study was conducted at Pain clinic and in Department of Orthopaedics, Government District hospital Chitradurga, Karnataka from November 2022 to October 2023. Patients were diagnosed with plantar fasciitis based on their history and radiological evaluation. Forty patients were enrolled in this study. The patients were selected randomly and were divided in two groups of 20 patients each (PRP and Steroid groups). Follow up done at 2 weeks, 6 weeks, 3 months and 6 months.

Inclusion criteria

1. Unilateral heel pain >4weeks.
2. Failure of conservative treatment >4 weeks
3. Not undergone any previous local injections in the heel.
4. Willing for follow-up

Exclusion criteria

1. Bilateral heel pain
2. Uncontrolled Diabetes mellitus
3. Not willing for follow-up

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

4. Infection or ulcer at the injection site
5. Patient with other medical illness
6. Foot deformity
7. Has undergone previous local injections
8. Patients who have had previous foot surgery
9. Pregnant females
10. Neuropathy conditions

Methodology: Patients who were clinically diagnosed with plantar fasciitis and who have fitted into above inclusion and exclusion criteria was explained about the procedure. The patients were informed about the study and informed written consent was obtained.

Procedure for corticosteroid injection: Under aseptic precautions, 20 patients were given 2ml (80 mg) of methylprednisoone acetate injection along with 0.5 ml of plain 2% lignocaine into the point of maximum tenderness. Post injection, patients were asked to rest for 15 minutes and then allowed to walk.

Procedure for PRP preparation: 20 ml of blood was withdrawn from the antecubital vein under all aseptic precautions and it was transferred to the EDTA-coated test tube. 5 ml of blood was transferred to 4 EDTA tubes and centrifuged for 10 minutes at 1200 rpm. Subsequently transferring the upper buffy layer in plane tubes and further re-centrifuged for 10minutes at 2000 rpm which separates PRP and WBC and then extracting 2-4ml of PRP.

Injection Technique: The patient is made to lie in a lateral position on the minor OT table with knee flexed up to 90 degrees. The affected foot is scrubbed with betadine scrub. Then cleaned with spirit and painted with betadine solution. Maximum tender point of the foot is palpated. Then with intramuscular needle the 3ml of PRP is injected in all directions.

Post Injection Protocol: The patients were monitored for 60 minutes after injection for any adverse reactions. After injection, all patients were advised to stop any vigorous or sportive activity. Physiotherapy was advised for all patients once the pain has subsided. The patients were

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

evaluated with visual analogue scale (VAS) score and AOFAS (American Orthopedic Foot and Ankle Society) score at the end of 6th week, 12th week and 6 months of follow up.

Statistical analysis: Descriptive statistics will be used for baseline parameters of the data. Qualitative variables will be presented as mean and standard deviations. p value lesser than 0.05 shows statistical significance. All data entered in Microsoft excel and analyzed using SPSS version 26.00.

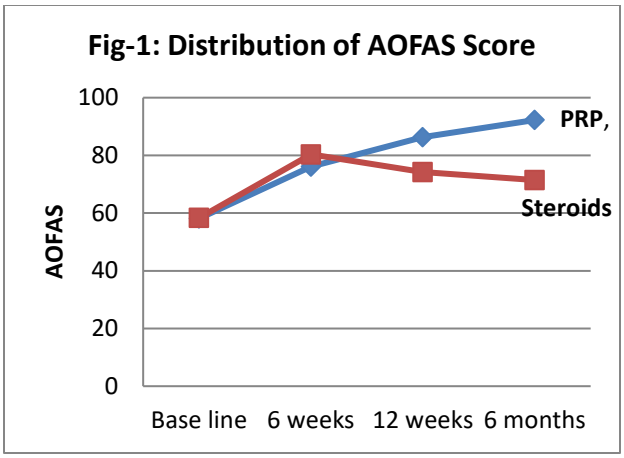
Results: A total of 40 patients were analyzed in this study with age ranging from 20 to 60 years. In both groups, right sided involvement was more than the left side. The average duration of symptoms was observed to be 16.24±1.23 weeks. The results show that there is no much difference in initial follow-up. Significant pain relief after 6 weeks of platelet rich plasma therapy and after at 3 months and 6 months follow up (Table 1).

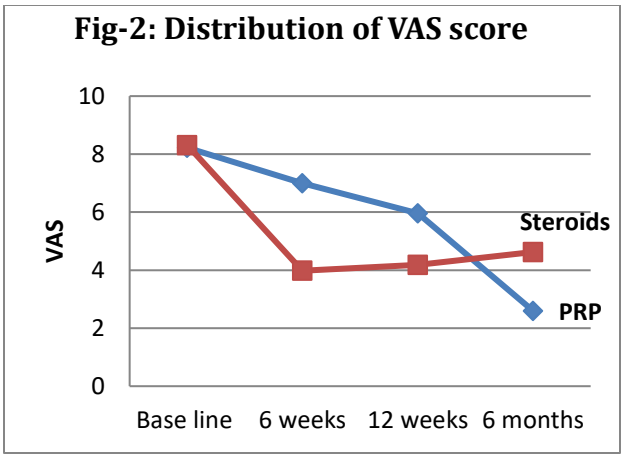
Table 1: Functional outcome analysis between the two groups

Parameters	Follow-up	PRP Group(n-20)	Steroid Group(n-20)	Significance
AOFAS	Base line	58.12±2.98	58.32±3.02	0.8342
	6 weeks	76.09±2.12	80.34±2.33	< 0.0001
	12 weeks	86.34±2.68	74.22±2.30	< 0.0001
	6 months	92.25±1.86	71.48±2.06	< 0.0001
VAS	Base line	8.22±0.64	8.31±0.65	0.6615
	6 weeks	7.00±0.98	3.98±1.01	< 0.0001
	12 weeks	5.96±0.62	4.18±0.86	< 0.0001
	6 months	2.6±1.02	4.62±0.76	< 0.0001

The patients showed a statistically significant improvement in both groups with respect to AOFAS Score and VAS scores. This improvement was significantly more in PRP group (Fig 1&2).

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024





Discussion: The plantar heel pain is very common complaint that causes significant discomfort and disability.[6] In 2004, Dr. Barrett proposed that the condition is actually a degenerative change of the plantar fascia and was commonly known as plantar fasciitis. It was also confirmed by pathologist results that samples from chronic plantar fasciitis sufferers contained very few inflammatory cells. Inflammation and degeneration are two of the events that are involved in the pathology's progression.[7]

Plantar fasciitis is commonly seen between the ages of 25 and 65 years old in some studies.[4,8] Our study showed age of patients with plantar fasciitis were ranging from 20 to 60 years. Celik D *et al* [9] reported that corticosteroid injection is more effective than physiotherapy; foot orthoses and PRP only in short term upto 6 weeks. Sellman JR *et al* [10] reported that there is an increased risk of plantar fascia rupture followed by corticosteroid injection. But in our study, we have not found any such complications. The VAS score after corticosteroid injection was reduced compared to VAS score taken before injection. In our study we also found reduction of VAS score after corticosteroid injection compared to baseline score.

Hsiao *et al* [11] showed PRP injection group had greater reduction in VAS score compared to corticosteroid injection group at three months. Shetty *et al* [12] compared the effects of corticosteroid (30 patients) with PRP injection (30 patients). They reported that PRP treatment shows VAS and AOFAS score more changes than in steroid group at 6 weeks and 6 months. Upadhyay S *et al* [13] studied 140 heels with follow up duration of 6 months. The score on VAS scale and AOFAS improved from base line for both group but the patients received PRP therapy had a statistically significant($p<0.05$) reduction in pain and improved functional AOFAS score at

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

last follow up. Vahdatpour B *et al* [14] have demonstrated superior results with PRP treatment over corticosteroids at the 6-month follow-up. Anand Kumar *et al* [15] concluded that PRP reduces pain for longer duration as compared to steroid but the difference is not statistically significant. In our study, statistically significant improvement in both groups with respect to AOFAS Score and VAS scores (Table-1). This improvement was significantly more in PRP group ($p<0.05$).

Conclusion: We concluded that PRP injection is more effective in resulting pain relief and function as compared to corticosteroid injection. These improvements were maintained over in our follow up period without any significant complications.

Conflict of interest: None

Source of income: None.

References

1. Tu P, Bytomski JR. Diagnosis of heel pain. *Am Fam Physician. 2011; 84(8):909-16.*
2. Buchbinder R. Clinical practice. Plantar fasciitis. *N Engl J Med 2004; 350:2159-66.*
3. Acevedo JI, Beskin JL. Complications of plantar rupture associated with corticosteroid injection. *Foot Ankle Int. 1998; 19:91-7.*
4. Jain K, Murphy PN, Clough TM. Platelet rich plasma versus corticosteroid injection for plantar fasciitis: A comparative study. *Foot (Edinb). 2015 Dec;25(4):235-7*
5. Marx RE. Platelet-rich plasma: evidence to support its use. *J Oral Maxillofac Surg. 2004; 62(4):489-96.*
6. Riddle DL, Schappert SM. Volume of ambulatory care visits and patterns of care for patients diagnosed with plantar fasciitis: a national study of medical doctors. *Foot Ankle Int.* 2004; 25(5):303–310.
7. Barrett, S.L., Erredge, S.E: Growth Factors for Chronic Plantar Fasciitis?. *Podiatry Today Vol.17 - Issue 11 - pages: 36 - 42, November 2004.*
8. Roxas M. Plantar fasciitis: Diagnosis and therapeutic considerations. *Altern Med Rev. 2005; 10:83–93.*
9. Celik D, Kus G, Sırma SÖ. Joint mobilization and stretching exercise vs steroid injection in the treatment of plantar fasciitis: a randomized controlled study. *Foot Ankle Int 2016; 37:150–6.*
10. Sellman JR. Plantar fascia rupture associated with corticosteroid injection. *Foot Ankle Int. 1994; 15:376–81.*
11. Hsiao M-Y, Hung C-Y, Chang K-V, Chien K-L, Tu Y-K, Wang T-G. Comparative effectiveness of autologous blood-derived products, shock-wave therapy and

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

corticosteroids for treatment of plantar fasciitis: a network meta-analysis. *Rheumatol Oxf Engl. 2015 Sep; 54(9):1735-1743.*

12. Shetty VD, Dhillon M, Hegde C, Jagtap P, Shetty S. A study to compare the efficacy of corticosteroid therapy with platelet-rich plasma therapy in recalcitrant plantar fasciitis: a preliminary report. *J Eur Soc Foot Ankle Surg. 2014 Mar; 20(1):10-13.*
13. Upadhyay S, Damor V. Autologous platelet rich plasmaversus corticosteroid injection for chronic plantar fasciitis: a prospective controlled randomized comparative clinical study. *Int J Res Med Sci 2018;6*
14. Vahdatpour B, Kianimehr L, Moradi A, Haghighat S. Beneficial effects of platelet-rich plasma on improvement of pain severity and physical disability in patients with plantar fasciitis: a randomized trial. *Adv Biomed Res. 2016;5:179*
15. Anandkumar P, Hussain LN. Comparative study of treatment of chronic plantar fasciitis using platelet rich plasma and local steroid injection. *IJOS. 2019; 5(3):196-9.*