

Original Research Article

A PROSPECTIVE STUDY BETWEEN LOCAL STEROID INJECTION AND PLATELET RICH PLASMA IN THE TREATMENT OF PLANTAR FASCIITIS

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ABSTRACT

Background: Plantar fasciitis is one of the most common problem in clinics and hospitals. The cause remains poorly understood and currently no single theory explains the pathogenesis of plantar fasciitis fully. There are so many treatment options available with variable success rates. **Purpose of the study:** To compare the effectiveness of platelet-rich plasma (PRP) and Triamcinolone acetonide injection in plantar fasciitis.

Materials and Methods: This prospective study was done in the Department of Orthopaedics, MVJ Medical College and Research Hospital, Hoskote, from March 2022 to February 2023. Patients presented with plantar fasciitis of which sixty patients who fit in the inclusion criteria were taken as the study population and divided into two groups A and B of size 30 each, undergoing PRP injection and Triamcinolone acetonide injection respectively. Patients evaluated clinically, post-injection for any local/systemic reactions. The effect of both will be assessed by the American Orthopaedic Foot & Ankle Society (AOFAS), and Visual Analog Score (VAS).

Result: Out of 60 cases, there were 18 bilateral cases and 42 unilateral cases. The mean pre-injection VAS scores of groups A and B were 8.9 and 8.1 respectively and at the 3-month follow-up 1.6 and 1.8 respectively. The mean pre-injection AOFAS scores of groups A and B were 31.7 and 29.9 respectively and at 3-month follow-up 83.8 and 78.9 respectively. The success rate was 76.6% after PRP and 66.6% after injection of triamcinolone acetonide.

Conclusion: Platelet-rich plasma or Triamcinolone acetonide injection in plantar fasciitis shows promising short-term results with gradual pain relief and improving daily activities. We believe that platelet-rich plasma is more effective than corticosteroid injection at 3 months of follow-up.

Keywords: Plantar fascia, PRP, triamcinolone, steroid.

INTRODUCTION

Plantar fasciitis is one of the most common diagnoses in clinics and hospitals.^[1] one in ten people were having this problem.^[2] Mostly seen in women than men with an age between 40 and 64 years.^[3] Bilateral cases up to 33% among plantar fasciitis patients.^[4-6] Flat foot, standing or walking on hard surfaces for a long time, and diabetes are some of the risk factors.^[3,7] For maintaining the

arches of the foot this plantar fascia plays an important role.^[8]

The plantar fascia starts from the calcaneum medial and the anterior part which is actually a fixed point which is the usual site of injury and inflammation and then extends to the proximal phalanx of five toes and it is an aponeurosis.^[9]

There is currently no single theory that fully explains the pathogenesis of plantar fasciitis. Some of the etiopathogenesis of PF are degenerative changes,

repetitive traction-producing microscopic tears, etc.^[10] The patients come to clinics and hospitals because of unbearable pain. Increased pain in the early morning in the heel is the typical symptom. Localized tenderness present at inferomedial aspect of calcaneal tuberosity.

Many treatment modalities have been proposed and have yielded different success rates. Conservative management includes rest, soft slippers.^[10,11] plantar fascia stretching exercises,^[12-14] topical medications with or without iontophoresis, oral nonsteroidal anti-inflammatory medications, extracorporeal shockwave therapy,^[15-19] laser, and intralesional steroid injections,^[20,21] or botulinum toxin type A. Surgical options with endoscopic or open fasciotomy can be the last resort for patients with intractable plantar fasciitis.^[22]

Corticosteroid injections have been used to treat plantar heel pain since the 1950s.^[23] Both orthopaedic surgeons and rheumatologists have been known to use them frequently.^[24] Although steroid injection is the mainstay for the management of many hyperinflammatory disorders, there is little known about steroid effects at the cellular level.^[25] Steroid injection can significantly improve foot pain in plantar fasciitis in short-term therapy.^[20,21] The advantages of corticosteroid injections include low cost, low complexity and rapid pain relief. The recommendation of corticosteroid injections as an initial treatment option was given by the American College of Foot and Ankle Surgeons (ACFAS).^[26] Many studies have been done to evaluate the efficacy of corticosteroid injections for the treatment of plantar fasciitis. Most compare its efficacy with that of other treatment modalities.

Various studies have shown that platelet-rich plasma injection as an effective treatment option for plantar fasciitis.^[27] Platelet-rich plasma (PRP) is emerging recently as therapy for plantar fasciitis treatment.^[28-31]

Objectives

The purpose of this study is to compare the effectiveness of platelet-rich plasma (PRP) and triamcinolone acetonide injection in plantar fasciitis.

MATERIAL AND METHODS

The study will be conducted in the Department of Orthopaedics, MVJ Medical College, Hoskote, Bangalore.

Sixty patients presented with plantar fasciitis pain for more than one month after conservative management and not taken intralesional injection before, who fit in the inclusion criteria were taken for the study.

Inclusion Criteria: Age more than 20 years, diagnosed for the first time, patient giving written informed consent to participate in the trial, one month of conservative management.

Exclusion Criteria: Recurrence of plantar fasciitis, rheumatological problems, known history of allergy

to corticosteroids, known history of foot and ankle injury.

The patients were randomized into two groups of size 30 each. Group A patients undergoing PRP injection, Group B patients undergoing Triamcinolone acetonide injection.

After obtaining ethical clearance, the study included 60 patients with plantar fasciitis based on criteria and after counseling for the procedure. Participants were divided by random charts into 2 groups. Group A was assigned to receive platelet-rich plasma and group B was assigned to receive triamcinolone acetonide.

PRP is obtained from a sample of patient's blood drawn at the time of treatment. Thirty ml of blood is taken from the vein and the PRP is prepared by using differential centrifugation. After the centrifuge, the upper plasma was transferred into another test tube and the again centrifuge at a higher speed will lead to concentrated platelets. The upper 2/3rd is platelet-poor plasma (PPP) and the lower 1/3rd is PRP. Upper part of PPP was removed and the remaining one is PRP of 2 to 4 ml.

In group B, 2 ml (1 mL of 40 mg of Triamcinolone acetonide, 1 ml of 2% plain xylocaine) was used for injection. A xylocaine test dose was given before the procedure. The injections were given at the point of maximum tenderness in the heel with a 22-g needle using a peppering technique.^[29,30] This technique involved the use of a single skin portal and 4 to 5 penetrations of the fascia.

Patients were instructed to use NSAIDs post procedure whenever get pain and instructed to use ice massage to get relief from the pain and to wear soft cushion chappals or shoes. All patients are advised to do plantar fascia stretching exercises.

Patients were assessed with visual analog scale for pain, the American Orthopaedic Foot and Ankle Society (AOFAS) pre-injection and post-injection during follow-up at 1 week, 3 weeks, 6 weeks, and 3 months in both the groups. Results were analyzed by using appropriate statistical methods and $p < 0.05$ was considered significant.

RESULTS

This study included a total of 60 cases suffering from plantar fasciitis. The mean age of the patients in the PRP group is 41.6 (SD – 9.25) and the triamcinolone group is 38.8 (SD – 9.05) (range 25-60).

Out of 60 cases, there were 18 bilateral cases and 42 unilateral cases. The mean pre-injection VAS scores of group A and B were 8.9 and 8.1 respectively. The mean pre-injection AOFAS scores of group A and B were 31.7 and 29.9 respectively. The mean VAS and AOFAS scores at the time of follow-up after one week, 3 weeks, 6 weeks, and 3 months as given in the table.

The mean post-injection VAS scores of group A and B at 3 months were 1.6 and 1.8 respectively. The

mean post-injection AOFAS score of group A and B 1] at 3 months were 83.8 and 78.9 respectively. [Table

Table 1: Socio-demographic Characteristics of the study population

	PRP (30)	STEROID (30)
AGE (mean)	41.6 (SD – 9.25)	38.8 (SD – 9.05)
MALE	7 (23.3)	13 (43.3)
FEMALE	23 (76.6)	17 (56.7)

Table 2: Comparison of the effect of treatment methods (group A and B) on VAS score

	Group A (30) MEAN +SD	Group B (30)	p-value
VAS score pre-op	8.9 + 0.682	8.1 + 0.602	0.148
VAS score at 1 wk	7.2 + 0.741	7.8 + 0.845	0.256
VAS score at 3 wk	6.5 + 0.654	6.9 + 0.684	0.623
VAS score at 6 wk	4.7 + 0.621	5.2 + 0.954	0.584
VAS score at 3 mon	1.6 + 0.523	1.8 + 0.548	0.215

Table 3: Comparison of the effect of treatment methods (group A and B) on AOFAS score

	Group A (30) MEAN +SD	Group B (30)	p-value
AOFAS score pre-op	31.7 + 7.236	29.9 + 8.258	0.246
AOFAS score at 1 wk	58.7 + 5.645	45.2 + 6.452	0.623
AOFAS score at 3 wk	64.8 + 5.658	58.6 + 5.432	0.587
AOFAS score at 6 wk	79.5 + 6.564	74.5 + 6.125	0.952
AOFAS score at 3 mon	83.8 + 5.125	78.9 + 5.752	0.328

Table 4: Patient Satisfaction

Categories	Group A (n=30)	Group B (n=30)	p-value*	
Satisfaction (%) in FU	1 wk	93.3%	90.0%	0.298
	3 wks	86.6%	83.3%	0.357
	6 wks	80.0%	76.7%	0.562
	3 mon	76.6%	66.6%	0.478

DISCUSSION

Plantar fasciitis is an inflammatory disease develops at the medial tuberosity of the calcaneum which is the origin take place where as in chronic cases it is changed to fibrous tissue.^[33] Majorly it is a self-limiting condition but in some patients, it will progress to chronic and effects their daily activities. In our study among 60 patients (male 20, female 40) unilateral 18 and bilateral 42 responded well to PRP and steroid injection by the end of 3 months with AOFAS scores 83 and 78 respectively compared to Raymond Rocco Monto, MD did a study in 40 patients (23 females and 17 males) with unilateral chronic plantar fasciitis were given an ultrasound-guided injection of 3 cc PRP or 40 mg DepoMedrol cortisone with AOFAS score in PRP group is 95 at 3 months and in the steroid group is 81 at 3 months.^[28] A study by Jain K, Murphy PN, and Clough TM the American Orthopaedic Foot and Ankle Society (AOFAS) score AOFAS score in the PRP group is 88 at 3 months and in the steroid group is 75 at 12 months.^[34] In this study the difference in the mean VAS and AOFAS score between the two groups was not statistically significant as shown in the table compared to the study done by Say F, Gurler D, Inkaya E, Bulbul M the difference in the mean VAS between the PRP group (2.4 ± 0.8 and 1 ± 0.8) and

the steroid group (4 ± 1.1 and 2.6 ± 0.9) at the 6th week and 6th month was statistically significant.^[31] In our study at the end of the three-month follow-up, the PRP group had slightly more patient satisfaction around 76% compared to the triamcinolone group which is around 66%. As per the Monto et al., study, who stated that platelet-rich plasma injection was more effective and durable than corticosteroid injection at 24-month follow-up.^[28] When Aksahin et al., compared intralesional corticosteroid and platelet-rich plasma injections for plantar fasciitis, the treatments were found to be equally effective.^[32] Limitations: Small sample size and short follow-up, a larger scale of study with a long-term follow-up is still necessary.

CONCLUSION

latelet-rich plasma or Triamcinolone acetoneid injection in plantar fasciitis shows promising short-term results with gradual pain relief, improving daily activities. We believe that platelet-rich plasma injection is more effective than corticosteroid injection at 3 months of follow-up.

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