



EFFICACY OF AUTOLOGOUS PLATELET RICH PLASMA INJECTION IN PLANTAR FASCIITIS

Orthopaedics

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ABSTRACT

Introduction: Plantar fasciitis is one of the most common causes of foot conditions. Incidence peaks between the ages of 40 and 60. The chronic inflammation of the fascia is caused by repeated microtrauma from heel striking, which also causes traction periostitis and inhibits the natural healing process. Platelet-rich plasma (PRP) is a new and promising method among the many conservative noninvasive courses of therapy. PRP is a concentrated platelet-rich solution with platelet levels many times higher than the baseline. **Aim And Objectives:** To study the efficacy of autologous platelet rich plasma in plantar fasciitis, in terms of VAS score and AOFAS Score. **Material And Methods:** The study was conducted in the department of orthopaedics at Muzaffarnagar Medical College with a case series of 80 patients. All patients included in the study were assessed by a visual analogue score (VAS) and the American Orthopaedic Foot and Ankle Society (AOFAS). **Results:** The mean VAS score at baseline was 8.01+0.83, 6 weeks was 4.41+2.43, 12 weeks was 2.89+2.75, 18 weeks was 2.36+2.71 and 24 weeks was 2.33+2.89. The mean AOFAS score at baseline was 51.85+6.14, 6 weeks was 72.96+12.84, 12 weeks was 80.83+12.93, 18 weeks was 84.43+12.75 and 24 weeks was 84.94+13.70. **Conclusion:** We concluded that PRP injections provide symptomatic relief by reducing pain in patients with plantar fasciitis. According to the VAS and AOFAS scores, there was a significant improvement in pain reduction. The study concludes that local PRP injection is a viable and safe treatment option for chronic plantar fasciitis.

KEYWORDS

INTRODUCTION

Plantar fasciitis is one of the most common causes of foot conditions [1]. Incidence peaks between the ages of 40 and 60 [2]. The chronic inflammation of the fascia is caused by repeated microtrauma from heel striking, which also causes traction periostitis and inhibits the natural healing process [1].

Excessive foot pronation, high arches, leg length discrepancies, and overweight people who spend a lot of time standing are risk factors for developing plantar fasciitis [3]. On the basis of the patient's medical history and physical examination, plantar fasciitis is diagnosed. When getting out of bed, the patient experiences initial pain. This pain eventually subsides with increased activity and is elicited by palpating the medial plantar calcaneal area [4].

Although plantar fasciitis is a self-limiting illness, full recovery might take three to eighteen months or longer, which impacts the quality of life [5]. Platelet-rich plasma (PRP) is a new and promising method among the many conservative noninvasive courses of therapy [6]. PRP is a concentrated platelet-rich solution with platelet levels many times higher than the baseline [2]. In addition to promoting tissue repair and stimulating fibroblast activity, it modulates collagen synthesis and reduces inflammation [7]. PRP contains a lot of platelets as well as all the essential clotting and growth factors [5].

The purpose of our study is to evaluate the efficacy of autologous PRP injection in planter fasciitis patients who doesn't have relief with conservative management.

AIMAND OBJECTIVES

To study the efficacy of autologous platelet rich plasma in plantar fasciitis, in terms of VAS score and AOFAS Score.

MATERIAL AND METHODS

The hospital-based prospective study was conducted in the department of orthopaedics at Muzaffarnagar Medical College with a case series of 80 patients.

Inclusion criteria:

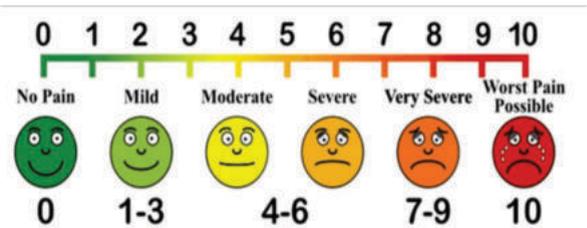
Patients should have minimum three months duration of symptoms, Patients should have visual analogue pain score greater than seven at the time of PRP injection., Patients should have AOFAS score less than sixty at the time of PRP injection., Patients should not had a local steroid injection in last 2 months, Age- 18 years and above.

Exclusion Criteria:

Less than 3 month duration of plantar fasciitis, Recent local steroid

injection, Infection or ulcer at the injection site. Patients were followed up every 6weeks interval till 24weeks and their improvements were noted as per VAS & AOFAS Score.

Vas Score



Aofas Score

AOFAS Ankle-Hindfoot Scale

I. Pain (40 points)

<input type="checkbox"/> None	+40
<input type="checkbox"/> Mild, occasional	+30
<input type="checkbox"/> Moderate, daily	+20
<input type="checkbox"/> Severe, almost always present	+0

Sagittal motion (flexion plus extension)

<input type="checkbox"/> Normal or mild restriction (30° or more)	+8
<input type="checkbox"/> Moderate restriction (15° -- 29°)	+4
<input type="checkbox"/> Severe restriction (less than 15°)	+0

II. Function (50 points)

Activity limitations, support requirements

<input type="checkbox"/> No limitations, no support	+10
<input type="checkbox"/> No limitation of daily activities, limitations of recreational activities, no support	+7
<input type="checkbox"/> Limited daily and recreational activities, cane	+4
<input type="checkbox"/> Severe limitation of daily and recreational activities, walker, crutches, wheelchair, brace	+0

Hindfoot motion (inversion plus eversion)

<input type="checkbox"/> Normal or mild restriction (75% -- 100% normal)	+6
<input type="checkbox"/> Moderate restriction (25% -- 74% normal)	+3
<input type="checkbox"/> Marked restriction (less than 25% of normal)	+0

Ankle-hindfoot stability (anteroposterior, varus-valgus)

<input type="checkbox"/> Stable	+8
<input type="checkbox"/> Definitely unstable	+0

Maximum walking distance, blocks

<input type="checkbox"/> Greater than six	+5
<input type="checkbox"/> Four-six	+4
<input type="checkbox"/> One-three	+2
<input type="checkbox"/> Less than one	+0

III. Alignment (10 points)

<input type="checkbox"/> Good, plantigrade foot, ankle-hindfoot well aligned	+10
<input type="checkbox"/> Fair, plantigrade foot, some degree of ankle-hindfoot malalignment observed, no symptoms	+5
<input type="checkbox"/> Poor, nonplantigrade foot, severe malalignment, symptoms	+0

Walking surfaces

<input type="checkbox"/> No difficulty on any surface	+5
<input type="checkbox"/> Some difficulty on uneven terrain, stairs, inclines, ladders	+3
<input type="checkbox"/> Severe difficulty on uneven terrain, stairs, inclines, ladders	+0

IV. Total Score (100 points):

Pain Points +	
Function Points +	
Alignment Points =	
<hr/>	
Total Points/100 points	

Gait abnormality

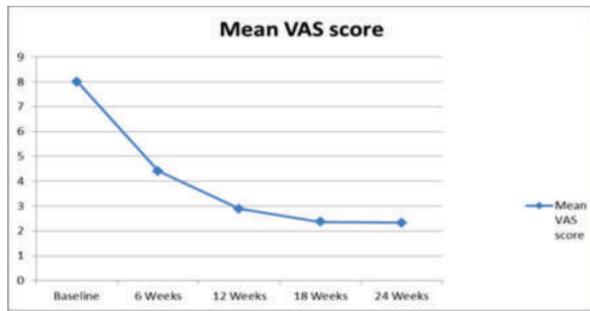
<input type="checkbox"/> None, slight	+8
<input type="checkbox"/> Obvious	+4
<input type="checkbox"/> Marked	+0

RESULTS

Comparison of mean VAS Score between different time intervals

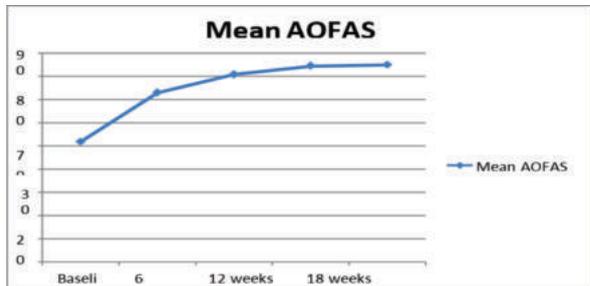
Comparison of mean AOFAS Score between different time interval

VAS score	mean	Std. Deviation
Baseline	8.01	0.83
6 weeks	4.41	2.43
12 weeks	2.89	2.75
18 weeks	2.36	2.71
24 weeks	2.33	2.89



Comparison of mean AOFAS Score between different time interval

AOFAS score	Mean	Std. Deviation
Baseline	51.85	6.14
6 weeks	72.96	12.84
12 weeks	80.83	12.93
18 weeks	84.43	12.75
24 weeks	84.94	13.70



Case



DISCUSSION

Chronic plantar fasciitis is a common foot problem. For patients, immediate symptom relief is necessary. Due to pain, a patient's daily activities are impacted, and their productivity is decreased. Rest or basic exercises may not give adequate pain relief in chronic plantar fasciitis. Exercise therapy is the most frequently advised kind of treatment. However, it does not provide long-lasting symptom relief. Corticosteroid injections are widely used to treat this condition, but

recurrence and consequences such as subcutaneous fat atrophy, rupture, and so on are common. However, corticosteroids are still often used. The surgical treatment for plantar fasciitis causes the foot's arch to collapse, resulting in a flat foot. The high concentration of growth factors in autologous platelet-rich plasma. This initiates the healing process and completes the tendon's repair. The in vitro results from Klein et al. [8] are used to support this study. This study found that transforming growth factor beta enhanced type 1 collagen synthesis in tendon sheath fibroblasts. Autologous platelet-rich plasma also helps in the recruitment of bone marrow-derived stem cells to the damaged tendon region. This regulates the microvascular environment, allowing the healing process to be completed.

Platelets contain physiologically active substances that aid in blood clotting, including coagulation factors, adhesive proteins, and protease inhibitors. Platelets have also been shown to secrete growth factors such as TGF-beta 1, CGF, VEGF, and PDGF. Once the platelets have been activated, these growth factors are released. These growth factors stimulate the process of tissue healing by stimulating cell proliferation and differentiation, chemotaxis, tissue debris clearance, angiogenesis, and cytoskeletal production [9]. By directly injecting localised autologous platelet-rich concentrate, degenerative enthesopathies such as plantar fasciitis are treated. Proteins have the ability to promote tissue healing.

Autologous platelet-rich plasma can be prepared using a variety of methods. They differ in terms of centrifugal duration and speed. To reduce direct handling of blood, several containers are also utilised to prepare platelet-rich plasma. The volume of platelet-rich plasma utilised is generally around 10% of the total volume of blood used. A GPS system was employed by Alsousou et al. to prepare PRP. 12 minutes of rotations at 3200 rpm yielded a prp volume of approximately 5 ml [9]. Using a two-fold centrifugation technique, Augustus D et al. first separated the plasma and RBC from the blood. By using a second centrifugation, the plasma generated was divided into platelet rich plasma and platelet poor plasma [10]. Augustus D et al. employed two-fold centrifugation in their study. We standardised the platelet-rich plasma preparation approach through trial and error.

CONCLUSION

We concluded that PRP injections provide symptomatic relief by reducing pain in patients with plantar fasciitis. According to the VAS and AOFAS scores, there was a significant improvement in pain reduction. The study concludes that local PRP injection is a viable and safe treatment option for chronic plantar fasciitis.

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