Original Research Paper

Volume - 14 | Issue - 08 | August - 2024 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Orthopaedics

THE EFFICACIOUSNESS OF AUTOLOGOUS PLATELET-RICH PLASMA INJECTION IN THE TREATMENT OF PLANTAR FASCIITIS.

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ABSTRACT **Purpose:** To evaluate the efficaciousness of autologous platelet-rich plasma (PRP) injections in treating plantar fasciitis, focusing on pain relief, functional improvement, and patient satisfaction. **Methods:** A prospective study was conducted on 40 patients (15 men and 25 women) who received platelet-rich plasma injections for plantar fasciitis between August 2020 and March 2022. The Visual Analogue Scale (VAS) and Numerical Rating Scale (NRS) were used to analyse the results. **Results:** Of the 40 patients, 31 (77.5%) had excellent outcomes according to the mean VAS with age for plantar fasciitis, and 9 (22.5%) had good clinical outcomes. At the time of injection, the mean pain score was 8.45%; at 1, 2, and 3 months, it was 4.925%, 3.375%, and 1.925%, respectively. **Conclusion:** The significant results demonstrate a proportional improvement attributed to platelet-rich plasma injections. This treatment modality resulted in reduced pain, favorable clinical outcomes, and a decreased need for surgical intervention in managing plantar fasciitis.

KEYWORDS : Platelet rich plasma, Plantar fasciitis, Visual analogue scale, Autologous.

INTRODUCTION:

Platelet-rich plasma (PRP) injections are extensively researched for treating various musculoskeletal conditions due to their enhanced healing properties. PRP contains growth factors including Insulin-like Growth Factor (IGF), Platelet-Derived Growth Factor (PDGF), Epidermal Growth Factor (EGF), Transforming Growth Factor (TGF), Vascular Endothelial Growth Factor (VEGF), and Fibroblast Growth Factor (FGF)[1]. These are associated with adhesive proteins like fibronectin and vitronectin, which play crucial roles in the healing response and regenerative processes such as chemotaxis, tissue debridement, cell proliferation, angiogenesis, extracellular matrix formation, osteoid production, and collagen synthesis, thereby accelerating the healing rate in chronic tendinopathies[2].

Plantar fasciitis is the most common cause of foot pain, affecting nearly 10% of the population, predominantly in the 40-70 age group[3]. It is more frequent in females than males and is also common among military recruits, athletes, and obese individuals. The condition is caused by repeated trauma from overuse or injury, leading to inflammation and degeneration at the origin of the plantar fascia at the medial tuberosity of the calcaneum[4,5]. Various treatment modalities have been recommended for managing this condition, including rest, non-steroidal anti-inflammatory drugs (NSAIDs), night splints, appropriate shoe wedges, soft heel pads, plantar stretching exercises, ultrasound massage, extracorporeal shock wave therapy, local corticosteroid injections, and surgical interventions[6,7].

PATIENTS AND METHODS:

A prospective analysis was conducted on 40 patients (15 males and 25 females) treated with platelet-rich plasma injections for plantar fasciitis between August 2020 and August 2022. The study duration was 3 years, with all patients being followed for a minimum of 6 months.

The results were assessed using the Visual Analogue Scale (VAS) and the Numeric Rating Scale (NRS)[8].

Inclusion Criteria:

- Patients with a diagnosis of plantar fasciitis.
- Patients must have experienced symptoms for at least three months.
- Pain scores exceeding seven at the time of injection.
- Both male and female patients.
- Patients aged 20 years and older.

Exclusion Criteria:

- Pain scores below seven
- Recent local steroid injections
- Patients with conditions such as rheumatoid arthritis or seronegative spondyloarthritis
- Infection or ulcer at the injection site
- Patients younger than 20 years

PAIN ASSESSMENT:

Visual Analogue Scale (VAS)

The patient rates the intensity of pain using a 10-centimeter line ranging from "No Pain" on one end to "Worst Possible Pain" on the other end

Based on the numerical pain score, pain intensity is classified as follows:

- Scores from 0 to 3 are classified as mild.
- Scores from 4 to 6 as moderate.
- Scores from 7 to 10 as severe pain

Method Of Preparation Of Platelet Rich Plasma:

First, a venous puncture is performed to collect a specific volume of the patient's own blood (10 ml) into a tube containing an anticoagulant (sterile sodium citrate tubes)

Figure 1: Test Tube Containing An Anticoagulant (Sodium Citrated Tube)

Figure 2 : Centrifuge Machine

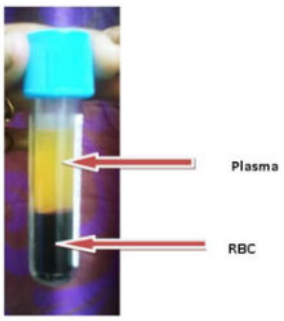

Figure 3

Following this, two centrifugation steps are performed **(Figure 2)**. The first centrifugation is conducted at 1800 rotations per minute (rpm) for 15 minutes, separating plasma from packed red blood cells. The top layer comprises plasma, while the bottom layer consists of red blood cells (**Figure-3**)

The plasma is transferred to a sterile tube, and the packed cell layer is then discarded. Subsequently, the second centrifugation is conducted at 3500 rpm for 10 minutes, resulting in a concentrated platelet layer after removing the platelet-poor plasma **(Figure 4).**

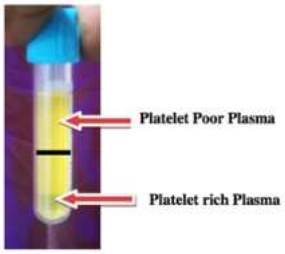

Figure – 4

Injection Technique:
The patient is positioned supine, and the most tender point is palpated and marked with a skin marker. The injection site is then prepared and draped. Initially, a local anesthetic block of lignocaine is injected subcutaneously. With strict aseptic measures in place, a 21-gauge needle is used to inject 1 ml of platelet-rich plasma directly into the most tender area, while the remaining plasma is administered into the surrounding tissues

Fig-5 : Injecting Platelet Rich Plasma In Plantar Fasciitis Patient.

Post Procedure Protocol:
After the injection, the patient is instructed to remain supine for 15 minutes without moving the foot. They receive guidance on limiting foot use for about 24 hours and using pain relievers before going home. Non-steroidal medications are not recommended. A standardized stretching protocol is provided for follow-up over two weeks[9]. After four weeks, patients are permitted to resume normal daily or sporting activities. Pain levels are assessed using a visual analog scale as an outcome measure.

Follow Up:
Patients were monitored for a duration of 6 months with follow-up appointments scheduled at the 1st, 3rd, and 6th months. Assessment of patients' condition was conducted subjectively using the Visual Analog Scale

RESULTS:
Age Incidence:

AGE	20-29	30-39	40 -49	50 -59	Total
Plantar fasciitis	2 (5%)	8 (20%)	20 (50%)	10 (25%)	40 (100%)

Sex Distribution:

SEX	MALES	FEMALES	TOTAL
Plantar fasciitis	15 (37.5%)	25 (62.5%)	40 (100%)

Comparison Of VAS Score With Age In Plantar Fasciitis:

VAS SCORE	AGE 20-29	AGE 30-39	AGE 40-49	AGE 50-59	Total
EXCELLENT	2 (100%)	8 (100%)	11 (55%)	10 (100%)	31 (77.5%)
GOOD	0	0	9 (45%)	0	9 (22.5%)
FAIR	0	0	0	0	0
TOTAL	2	8	20	10	40
CHI SQ – 11.613	P value – 0.009				

MEAN PAIN SCORE:
Initially, the mean difference in the Visual Analog Scale (VAS) scoring system at presentation was 8.45%. Subsequently, there was a progressive and statistically significant improvement in scores, with reductions observed at the 1st month (4.925%), 3rd month (3.375%), and 6th month (1.935%) follow-up assessments.

DISCUSSION:
The increasing popularity of platelet-rich plasma injections for conditions like plantar fasciitis has markedly risen over the past decade. This study aims to assess the effectiveness of platelet-rich plasma in treating plantar fasciitis[10]. We enrolled 40 patients diagnosed with plantar fasciitis, comprising 15 males (37.5%) and 25 females (62.5%).

There was a significant difference in the Visual Analog Scale (VAS) scores among different age groups at the conclusion of the average 6-month follow-up period, with a calculated p-value of 0.009, indicating statistical significance.

Initially, the mean pain score at presentation was 8.45%. There was a steady and notable improvement in scores, with reductions observed at the 1st month to 4.925%, 3rd month to 3.375% and 6th month to 1.935%, follow-up assessments, indicating significant improvement in outcomes over the 6-month period. Therefore, the use of platelet-rich plasma injections for plantar fasciitis has demonstrated significant efficacy due to its healing properties[11,12].

CONCLUSION:
The significant variation in P-values across different age groups indicates a proportional improvement attributed to platelet-rich plasma injections. Therefore, this treatment approach demonstrates reduced pain, favorable clinical outcomes, and a decreased need for surgical intervention in managing plantar fasciitis.

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