Local Injection of Autologous Platelet Rich Plasma and Corticosteroid in Treatment of Plantar Fasciitis in Female Patients

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ABSTRACT

**Background:** Chronic plantar fasciitis is the commonest cause of foot complaints in India. The incidence of plantar fasciitis peaks in people between the ages of 40 to 60 years with no bias towards either sex. Numerous methods have been advocated for treating plantar fasciitis, including rest, non-steroidal anti-inflammatory medication, night splints, foot orthosis, stretching protocols and extracorporeal shock wave therapy. The aim of this study to compared the functional outcome of Local Steroid and PRP in Plantar Fasciitis. **Methods:** A prospective randomized control trial done on 63 patients with complaint of plantar fascitis coming to SMS Medical College & Hospitals, Jaipur, who were attain the inclusion criteria in the study. Patient coming to OPD were randomly allocated C.R. number. Patients with Odd C.R. number were given PRP and those with even number were given Steroids. Patients were followed at 12 weeks and 24 weeks after the injection to look for the effect of PRP and corticosteroid. Then the results were obtained on mean VAS score and AOFAS score in both the groups. **Results:** The present study showed that the mean age was 40 years in group I and 39 years in group II. Maximum females were housewife (41.26%) in both groups. The difference of mean between in between, VAS score & AOFAS was insignificant in first visit (P=0.8642 & P=0.3400) and statistical significant after 12 weeks (P<0.0001*** each) and 24 weeks (P<0.0001***each). **Conclusions:** We believe that PRP injection is safe and can be an excellent alternative to corticosteroid injection in plantar fasciitis, not responsive to conservative means. The findings of this preliminary study can be very relevant in clinical practice.

**Key words:** Plantar Fasciitis, Corticosteroids, Platelet rich plasma, AFOA score, VAS Score

INTRODUCTION

The plantar fascia is a longitudinal bundle of thick fibrous bands that originate off the medial tubercle of the calcaneous. These bundles condense to form the arch of the foot. The plantar fascia is a durable, longitudinal bundle of thick fibrous bands that originate off the medial tubercle of the calcaneous. These bundles condense to form the arch of the foot converting potential energy to kinetic energy during toe-off.[¹,²]

Chronic plantar fasciitis is the commonest cause of foot complaints in India. The incidence of plantar fasciitis peaks in people between the ages of 40 to 60 years with no bias towards either sex.[³] The underlying condition that causes plantar fasciitis is a degenerative tissue condition that occurs near the site of origin of the plantar fascia at the medial tuberosity of the calcaneous.[⁴] According to the World Health Organization (WHO), musculoskeletal injuries are the most common cause of severe long physical disability, and affect hundreds of millions of people around the world.[⁵] Numerous methods have been advocated for treating plantar fasciitis, including rest, non-steroidal anti-inflammatory medication, night splints, foot orthosis, stretching protocols and extracorporeal shock wave therapy. Steroid injections are a popular method of treating the condition but only seem to be useful in the short term and only to a small degree.[⁶] Other various types of surgical procedures have also been recommended.[⁷] The use of corticosteroids is particularly troubling as several studies have linked plantar fascia rupture to repeated local injections of a corticosteroid.[⁸,⁹] When
neither rest and neither activity restriction nor conservative treatments result in a satisfactory outcome, the patient is often interested in treatment options other than surgery. The use of autologous PRP was first used in 1987 by Ferrari et al.[10] Platelet-rich plasma (PRP) is a bioactive component of whole blood with platelet concentrations elevated above baseline and containing high levels of various growth factors.[11] The rationale for PRP benefit lies in the reversing the blood ratio by decreasing red blood cells (RBC) to 5%, which are less useful in the healing process, and increasing platelets to 94% to stimulate recovery.[12] An increased awareness of platelets and their role in the healing process has led to the concept of therapeutic applications. There is emerging literature on the beneficial effects of PRP for chronic non-healing tendon injuries including lateral epicondylitis and plantar fasciitis.[13] The findings of existing clinical trials provided some support for the use of corticosteroid injection in the short term plantar fasciitis.[14] The aim of this study to compare the functional outcome of Local Steroid and PRP in Plantar Fasciitis.

METHODS

Patient recruitment
A prospective randomized control trial done on 63 patients with complaint of plantar fasciitis coming to SMS Medical College & Hospitals, Jaipur, who were attain the inclusion criteria in the study. Patients of plantar fasciitis in presence of other systemic disease like cardiovascular disease, anemia, renal or hepatic disease, pregnancy, any local infection or malignancy, diabetes, neuropathy or any vascular insufficiency were excluded from this study. Tenderness in the heel on weight bearing and firm pressure with thumb by palpation especially at the medial side of heel was two main criteria for the diagnosis. Then patients of plantar fasciitis were evaluated using VAS score and AOFAS score. Patients with VAS score >5 were treated further either with corticosteroid or PRP injection. Patient coming to OPD were randomly allocated C.R. number. Patients with Odd C.R. number were given PRP and those with even number were given Steroids. Patients were followed at 12 weeks and 24 weeks after the injection to look for the effect of PRP and corticosteroid. Then the results were obtained on mean VAS score and AOFAS score in both the groups.

RESULTS
The present study showed that mean age was 40 years in group I and 39 years in group II (table1). Maximum females were housewife (41.26%) in both groups. The difference of mean in between groups, VAS score was insignificant in first visit (P=0.8642) and statistical significant after 12 weeks (P<0.0001*** ) and 24 weeks (P<0.0001*** ) (table 2). AOFAS score was insignificant in first visit (P=0.3400) and statistical significant after 12 weeks (P<0.0001*** ) and 24 weeks (P<0.0001*** ) (Table 3).

Table 1: Mean age wise distribution of cases

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Group I (PRP Injection)</th>
<th>Group II (Corticosteroid Injection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>40.08</td>
<td>39.22</td>
</tr>
<tr>
<td>SD</td>
<td>6.597</td>
<td>7.036</td>
</tr>
<tr>
<td>Range</td>
<td>24-55 yrs</td>
<td>24-50 yrs</td>
</tr>
<tr>
<td>P-value</td>
<td>0.6257</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Plantar fasciitis (PF) is a common clinical problem with many available treatment modalities. Traditional treatment for PF includes rest, analgesics and stretching exercises. Injections, particularly corticosteroids, are given in very acute situations and for cases unresponsive to conservative methods. Corticosteroids offer a quick fix for pain relief in the acute phase but have limited effect in chronic cases with a significant fraction of patients suffering from relapse and recurrence.[15,16]

This study was designed to compare the efficacy of corticosteroid therapy to PRP therapy for PF. PRP contains a more concentrated amount of platelets than does whole blood. Within platelets are powerful growth factors, including platelet-derived growth factor, transforming growth factor beta, and epidermal growth factor. The injection of PRP into the affected tissue initiates the healing stages necessary to reverse the degenerative process at the base of the plantar fascia. The individual cytokines present in the platelet a-granules have been shown to enhance fibroblast migration and proliferation, up-regulate vascularization and increase collagen deposition in a variety of in vitro and in vivo settings.[17] Additionally, many of these cytokines have been seen to work in a dose dependent manner. The concentrated growth factors work in a synergistic manner to initiate a tendon healing response. Transforming growth factor b1 is shown to significantly increase type I collagen production by tendon sheath fibroblasts. This same mechanism is likely to be active in chronic plantar fasciitis.[18]

In 2010, Peerbooms et al.[19] studied 100 patients and demonstrated a positive effect of PRP for tennis elbow. This report describes the first comparison of an autologous platelet concentrate with corticosteroid injection as a treatment for tennis elbow in patients who have had unsuccessful non-operative treatment. It demonstrates that a single injection of concentrated autologous platelets...
improves pain and function more than corticosteroid injection. These improvements were sustained over time with no reported complications. Barrett and Erredge reported a 78% success rate with PRP in PF patients in 1-year follow-up. The same authors also documented a decrease in plantar fascia thickness, detected by ultrasound, over time when treated with PRP.

CONCLUSION
PRP injection is an efficient and safe therapeutic option for the treatment of chronic plantar fasciitis. However, there is a need for larger, long-term studies to verify the effectiveness of PRP for the treatment of plantar fasciitis.

REFERENCES