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Platelet power vs steroid strength: A prospective comparative study for chronic plantar fasciitis treatment

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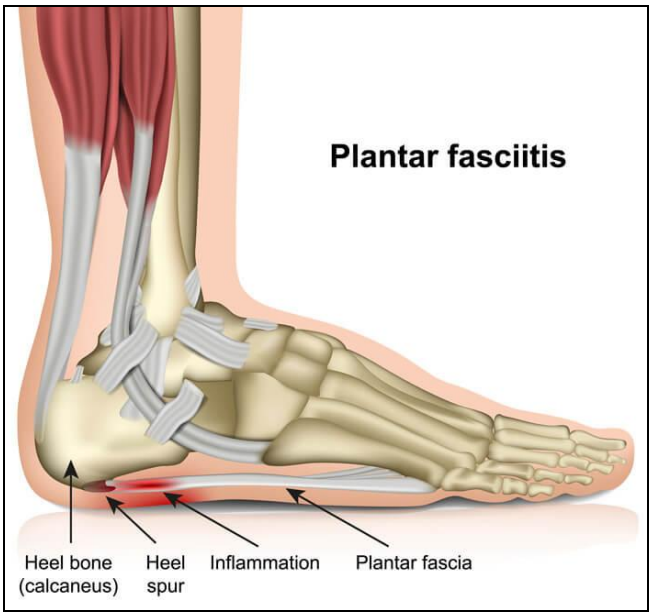
Abstract
Background: Plantar fasciitis is a common orthopedic condition that can significantly impact quality of life. Various treatment approaches have been explored, ranging from conservative management to surgical interventions. Multiple studies worldwide have compared the efficacy of local platelet-rich plasma (PRP) injections versus corticosteroid injections, yielding mixed results.
Materials and Methods: This study was conducted at Shree Bhausaheb hire government medical college, Dhule, Maharashtra, India, following approval from the Institutional Ethics Committee (IEC). Between January 2024 to December 2024, a total of 50 patients were enrolled through random sampling after obtaining written informed consent.
Results: Plantar fasciitis was most frequently observed in individuals aged 31–40 years and was more common in females than males. Occupation-wise, housewives and service providers were more commonly affected. Both local corticosteroid injections and autologous PRP injections were found to be effective in managing chronic plantar fasciitis. Corticosteroid injections provided rapid pain relief in the short term, but their efficacy declined over time. In contrast, PRP injections demonstrated superior long-term pain reduction. Patient outcomes were evaluated using the American Orthopedic Foot and Ankle Society (AOFAS) score and the Visual Analogue Scale (VAS) at baseline, 4 weeks, 6 weeks and 8 weeks. Assessments were performed for both treatment groups.
Conclusion: Both corticosteroid and autologous PRP injections are effective treatment options for chronic plantar fasciitis. Corticosteroid injections are beneficial for short-term pain relief (up to 12 weeks in this study), whereas PRP injections provide more sustained, long-term pain improvement.

Keywords: Fasciitis, injection, plantar, PRP, steroid

Introduction
Plantar fasciitis (PF) is a prevalent musculoskeletal disorder characterized by heel pain, particularly during the initial steps after periods of rest. The plantar fascia, a dense connective tissue structure on the sole of the foot, attaches to the calcaneus at the medial calcaneal tubercle. Repetitive stress and microtrauma to this area can lead to inflammation and degeneration, resulting in pain and functional impairment.
Management of PF encompasses a spectrum of interventions, ranging from conservative measures to surgical procedures. Conservative treatments include stretching exercises, orthotics, nonsteroidal anti-inflammatory drugs (NSAIDs), and physical modalities such as shockwave therapy and laser treatment [1]. However, for persistent cases, corticosteroid injections have been commonly utilized due to their anti-inflammatory effects. Recent studies have highlighted the limitations of corticosteroids, including potential side effects such as plantar fascia rupture and fat pad atrophy.
In response to these concerns, regenerative therapies like platelet-rich plasma (PRP) injections have gained attention. PRP involves the injection of autologous blood components rich in growth factors to promote tissue healing and regeneration. Recent research indicates that PRP may offer superior long-term outcomes compared to corticosteroids. A study published in the *American Journal of Physical Medicine & Rehabilitation* in 2025 found that PRP injections resulted in significantly better American Orthopaedic Foot and Ankle Society (AOFAS) scores

at 3, 6, and 12 months compared to corticosteroid injections. Additionally, PRP demonstrated more favorable outcomes in terms of plantar fascia thickness and overall foot function [2].
Furthermore, a 2024 study published in *The Journal of Foot and Ankle Surgery* [3] found that PRP injections provided more effective pain relief and functional improvement compared to corticosteroid injections in the medium term. The study emphasized the potential of PRP as a safe and effective alternative for treating PF pain.
Emerging therapies such as low-dose radiation therapy (LDRT) are also being explored for PF treatment. A 2025 report highlighted the use of LDRT in treating benign inflammatory conditions, including PF. LDRT works by suppressing inflammatory cells to reduce pain and swelling, offering a potential alternative for patients unresponsive to conventional treatments.
In conclusion, while corticosteroid injections have been a mainstay in PF management, recent advancements in regenerative therapies like PRP and emerging modalities such as LDRT offer promising alternatives. Further research is warranted to establish standardized protocols and determine the long-term efficacy of these treatments in PF management.



Objectives of the research [4]
This research aims to assess the values of functional outcomes for local steroids along with comparison. In addition, this research has the following objectives:
1. To study plantar fasciitis.
2. To study the effectiveness of the use of steroids and PRP in plantar fasciitis.
3. To analyze and compare functional outcomes for steroid and PRP in plantar fasciitis.

Materials and methods
- **Study design:** A hospital-based Prospective study.
- **Study Duration:** 1 year
- **Study area:** The study will be done at tertiary care center on attending OPD/IPD.
- **Study population:** All Patients with chronic Tertiary care Hospital, who will fulfill the inclusion criteria.

Sample Size
A priori sample size calculation was performed to determine the minimum number of patients required in each group to detect a statistically and clinically meaningful difference in treatment outcomes between platelet-rich plasma (PRP) and corticosteroid injections in patients with chronic plantar fasciitis.
Since the primary outcome was a continuous variable (e.g., Visual Analog Scale [VAS] and American orthopedic foot and ankle society [AOFAS] score for pain), the sample size was calculated using the formula for comparing two independent means:

Formula Used

$$n = \frac{2(Z_{\alpha/2} + Z_{\beta})^2 \cdot \sigma^2}{\Delta^2}$$

Where:

- n = required sample size per group
- $Z_{\alpha/2}$ = 1.96 (for α = 0.05, two-tailed)
- Z_{β} = 0.84 (for 80% power)
- σ = estimated standard deviation (assumed as **1.8**, based on previous studies)
- Δ = expected mean difference in VAS scores (assumed as **1.5 points**)

Calculation

$$n = \frac{2(1.96 + 0.84)^2 \cdot (1.8)^2}{(1.5)^2} = \frac{2(7.84) \cdot 3.24}{2.25} = \frac{50.8032}{2.25} \approx 22.6$$

Thus, a minimum of 23 patients per group would be required. To account for potential dropouts and maintain adequate power, the final sample size was increased to 25 patients per group, resulting in a total of 50 patients.

Inclusion and Exclusion Criteria
Inclusion Criteria
- Plantar fasciitis patients aged 20 to 60 years.

Exclusion Criteria
- Patients under 20 or over 60 years old.
- Patients lost to follow-up.
- Patients with pre-existing bone diseases.

Assessments for research
A prospective study was conducted in a Tertiary care hospital after obtaining approval from the IEC. This study included 50 patients from January 2024 to December 2024, after obtaining written consent from the patients. Patients were evaluated at pre-treatment time and according to sequence of presentation to the hospital, via alternate allocation (odd-even sequence) method, sequential even number were injected with PRP, whereas sequential odd number were injected with corticosteroid, 25 patients received steroid injection and 25 patients were injected with PRP and then follow-up was done at 2 weeks, 4 weeks, 8 weeks and finally at 12 weeks based on Visual Analogue Score (VAS) from 0 to 10 and AOFAS score. There were zero drop-outs during the follow-up.

AGE wise distribution of patietns in PRP Group and steroid group
According to **Error! Reference source not found.** Out of 25 patients in PRP group 3 patients were in the age group 20-30 years, 7 were in 31-40 years, 6were in 41-50 and 7 in 51-60.

In steroid group, out of 25 patients, 2 were in 20-30 years, 7 in 31-40 years, 8 in 41-50 years and 8 in 51-60 years. Plantar fasciitis was seen more commonly in the age group 40-50 years.

Table 1: age wise distribution of patients in PRP nad steroid group

Age (yrs)	Group I	Group II	Total
20-30 yrs	3 (12%)	2 (8%)	5(10%)
31-40 yrs	7 (28%)	7 (28%)	14(28%)
41-50 yrs	6 (24%)	8 (32%)	16 (32%)
51-60 yrs	7(28%)	8 (32%)	15(30%)

The mean patient age was 43.8 ± 9.48 years in PRP group with minimum age of 28 and maximum age of 60 years and for group II, it is 44.24 ± 9.89 with minimum age of 27years and maximum age of 59 years.

Table 2: Mean age wise distribution of cases

Age (yrs)	Group I (PRP Injection)	Group II (Corticosteroid injection)
Mean	43.8	44.24
SD	9.48	9.89
Range	28-60 yrs	27-59 yrs
P-value	0.87	

Gender wise distribution of cases

Plantar fasciitis was seen more commonly in females (56%) than males (44%).

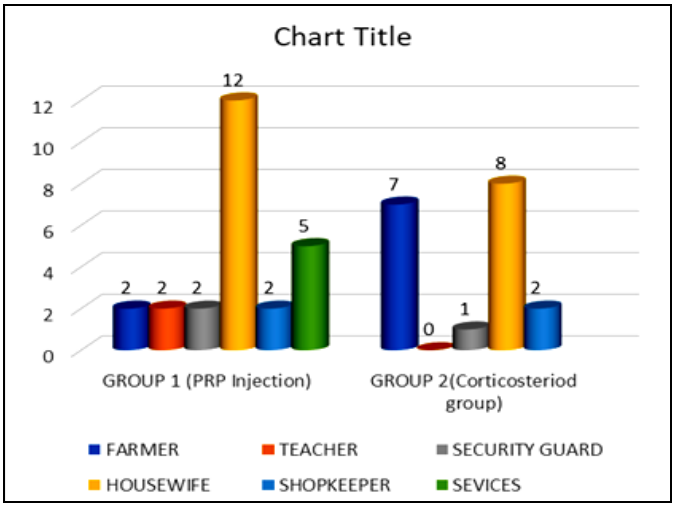
Out of 25 patients in PRP group, 5 (10%) were males and 20 40%) were females whereas out of 25 patients in steroid group, 17 (34%) were males and 8 (16%) were females.

Table 3: Gender wise distribution of cases

Gender	Group I (PRP Injection)	Group II (Corticosteroid injection)	Total
Male	5(10%)	17(34%)	22(44%)
Female	20 (40%)	8 (16%)	28 (%)
Total	25 (50%)	25 (50%)	50 (100%)

Occupation wise Distribution of Patients in PRP Group and Steroid Group

In our study, maximum patients were house wives followed by service man and farmers.



Mean VAS score

Distribution of patients in PRP Group and Steroid Group according to VAS score at Pre-treatment and Follow up visits at 2 weeks, 4 weeks,8 weeks,12 weeks.

The mean VAS score improvement was greatest at 12 weeks in the PRP group (2.30 ± 1.41) and at 4 weeks in the steroid group (3.19 ± 1.89), indicating PRP's peak effect at 12 weeks and steroids' peak at 4 week.

Mean AOFAS score

Distribution of patients in PRP Group and Steroid Group according to AOFAS score at Pre-treatment and Follow up visits at 2 weeks, 4 weeks,8 weeks,12 weeks.

The mean AOFAS score improvement was greatest at 12 weeks in the PRP group (86.42 ± 2.16) and at 4 weeks in the steroid group (83.24 ± 3.78), indicating PRP's peak effect at 12 weeks and steroids' peak at 4 weeks.

Discussion

Plantar fasciitis is a prevalent cause of heel pain, impacting a substantial number of individuals [5]. Studies indicate that approximately 10% to 16% of people will encounter plantar fasciitis at some stage in their lives. This condition is often linked to repetitive strain injuries, which typically occur at the plantar fascia's origin due to excessive stress or foot structure irregularities. Plantar fasciitis can result in inflammation, degeneration, or irritation of the fascia and surrounding tissues, including the medial calcaneal tubercle. Abnormal foot biomechanics are a common contributing factor, particularly in certain populations [6]. Research has shown that these biomechanical issues can lead to problems, highlighting the importance of proper foot function. Demographically, plantar fasciitis affects women between the ages of 31 and 50 more frequently. However, observations also indicate a higher incidence in men, particularly those aged 40-70, who are more susceptible to the condition compared to women. Following a clinical diagnosis, the rehabilitation period for plantar fasciitis can last several months, with management options including conservative or surgical methods. Localized tenderness on the medial side of the calcaneum is often indicative of plantar fasciitis. This condition is diagnosed based on medical history and physical examination findings, characterized by pain in the heel, especially when weight-bearing [7]. Symptoms include sharp or throbbing pain, particularly noticeable during initial morning steps or after prolonged inactivity. Conservative treatment methods are typically employed to manage plantar fasciitis, focusing on medication and physical therapy. Nonsteroidal anti-inflammatory drugs (NSAIDs) and local steroid injections are common medical therapies. A study comparing the efficacy of autologous platelet-rich plasma (PRP) and steroid injections in treating plantar fasciitis revealed significant improvements in pain scores at 4 and 12 weeks. However, at the 12-week mark, the PRP group sustained pain reduction, whereas the steroid group's improvement waned. Similar trends were observed in the Ankle-Hindfoot Scale (AOFAS) scores, with the PRP group demonstrating continuous improvement over 12 weeks, while the steroid group showed initial gains followed by a decline. Key findings are summarized in the mean AOFAS and VAS scores at various intervals, highlighting the comparative effectiveness of PRP and steroid injections in managing plantar fasciitis.

Wei-yang *et al.* concluded that there is no differences in functional improvement were observed between PRP and steroid treatments. Considering the long-term effectiveness of PRP, we recommend the use of PRP as the preferred

treatment for PF [8].

Table 4: Mean VAS score

VISITS	Group I (PRP Injection)	Group II (Corticosteroid injection)	P-value
Ist Visit (Pre-treatment)	44.44±3.62	44.6±4.78	0.8642 NS
Follow up at 2 weeks	52.96±10.51	69.44±11.85	<0.0001***
Follow up at 4 weeks	72±6.83	83.24±3.78	<0.0001***
Follow up at 8 weeks	85.04±4.17	77.35±6.92	<0.0001***
Follow up at 12 weeks	85.04±4.25	62.08±10.94	<0.0001***

Table 5: Mean AOFAS score

VISITS	Group I (PRP Injection)	Group II (Corticosteroid injection)	P-value
Ist Visit (Pre treatment)	8±0.75	8±0.98	0.8642 NS
Follow up at 2 weeks	7.44±0.94	4.28±1.67	<0.0001***
Follow up at 4 weeks	2.92±1.87	3.19±1.89	<0.0001***
Follow up at 8 weeks	2.30±1.41	3.58±1.87	<0.0001***
Follow up at 12 weeks	2.28±1.5	4.15±2.04	<0.0001***

Conclusion

Our study reveals that plantar fasciitis predominantly affects individuals between 31 and 40 years old, with a higher incidence among females, particularly those in housekeeping and service-related occupations. Both local steroid injections and autologous platelet-rich plasma (PRP) therapy are effective treatments for chronic plantar fasciitis. However, steroid injections offer short-term pain relief (up to 12 weeks), whereas PRP injections provide sustained relief beyond 24 weeks. The findings suggest that plantar fasciitis occurrence varies across occupational groups, age ranges, and genders due to differing job demands. Plantar fasciitis is a frequent source of heel pain, impacting individuals regardless of their athletic status. Diagnosis is often based on a thorough evaluation of medical history and assessment of localized tenderness. Management strategies may include rest, stretching exercises, modifications to footwear, orthotics, and pharmacological interventions. Treating chronic plantar fasciitis is challenging and time-consuming. Our study confirms that while local steroid injections provide immediate relief, their effectiveness wanes over time. In contrast, autologous PRP injections demonstrate better long-term pain relief with minimal complications, making them a viable treatment option for chronic plantar fasciitis.

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