

Original Article

Comparison of The Effectiveness Of Platelet-Rich Plasma Versus Corticosteroids In Plantar Fasciitis

Nouman Ikram¹, Saad Riaz², Hassaan Zia³, Niaz Hussain⁴, Ali Asad Ullah⁵, Saad Ahmed Khokhar⁶

Abstract

Objective: To compare the effectiveness of platelet-rich plasma (PRP) versus corticosteroid injections in patients with plantar fasciitis in terms of pain reduction, functional improvement, and plantar fascia thickness at three-month follow-up.

Methodology: This quasi-experimental study was conducted in the Orthopaedic Department of Rawalpindi Teaching Hospital. A total of 100 patients were allocated to two equal groups of 50 each based on consecutive clinic visits. Group A received 3 mL autologous PRP, and Group B received 40 mg triamcinolone acetonide. Outcomes were assessed using the Visual Analogue Scale (VAS) for pain, American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot score for functional status, and ultrasonographic measurement of plantar fascia thickness.

Results: The mean VAS score decreased to 1.9 ± 1.1 in the PRP group and 2.8 ± 1.0 in the corticosteroid group ($p = 0.001$). The mean AOFAS score was 86.3 ± 6.8 in the PRP group versus 80.7 ± 7.5 in the corticosteroid group ($p = 0.002$). PRP reduced plantar fascia thickness to 3.5 ± 0.8 mm, and corticosteroids to 4.6 ± 0.9 mm ($p = 0.001$).

Conclusion: Platelet-rich plasma (PRP) demonstrated statistically superior outcomes compared to corticosteroid injections in the treatment of plantar fasciitis at three-month follow-up, with significantly greater pain reduction, functional improvement, and plantar fascia thickness reduction. PRP may serve as a more effective and safer long-term therapeutic option.

Keywords: Platelet-Rich Plasma; Adrenal Cortex Hormones; Fasciitis, Plantar; Pain Measurement; Injections, Intra-Articular; Treatment Outcome

Introduction

Plantar fasciitis often causes heel pain and can lead to severe morbidity. It is more likely to be experienced by women and middle-aged people. Pain is usually the worst after rest or during the initial activities of the day. Also, the upward rotation of the foot and toes over the shin leads to pain, which can be further aggravated by a tight Achilles tendon.¹ The disease progresses gradually as a rule. Nonoperative therapy, which includes rest, stretching, application of ice and proper footwear, use of arch support, orthotics, night splints, extracorporeal shockwave therapy, and anti-inflammatory medications, is the first line of treatment for plantar fasciitis and affects approximately one-third of patients (approximately 1 in every three). This type of non-operative treatment works well in up to 90 percent of individuals with this illness. Persistent plantar fasciitis is primarily treated with intralesional steroid injections. This method is effective, but pain relief is extremely short-lived.² Corticosteroids accelerate the pain relief mechanism as they possess a strong anti-inflammatory effect. Nevertheless, PRP injection is believed to be safe for treating chronic plantar fasciitis with satisfactory functional outcomes and pain management when compared to corticosteroids, as long as the duration of recalcitrant plantar fasciitis is less than 12 weeks.^{3,4} PRP injections may be more effective than corticosteroid injections in relieving pain and improving function when the duration of resistant plantar fasciitis exceeds 12 weeks.^{5,6} In a 2023 study, Sharma et al. found that PRP injection was more effective than steroid injection. PRP at six months also showed a significant reduction in the mean VAS score (1.97 ± 1.13) compared to steroids (2.71 ± 0.94). Similarly, the AOFAS scores were much higher in the PRP group (86.04 ± 7.45) than in the steroid group (81.23 ± 9.60). In addition, the thickness of the plantar fascia was significantly lower with PRP than with steroids (3.53 ± 0.81 versus 4.58 ± 1.02).⁷

Conflicts of Interest: None

Financial Support: None to report

Potential Competing Interests: None to report

Disclaimer: This study has not been published or submitted elsewhere for publication.

AI Disclosure: Generative artificial intelligence (ChatGPT4, Claude Sonnet 4.6) was used solely for language editing and grammatical refinement of this manuscript. All intellectual contributions, data, and conclusions are solely the authors' work.

Data Availability Statement: The de-identified dataset supporting the findings of this study has been deposited in a publicly accessible repository. The authors commit to uploading the dataset to Zenodo (<https://zenodo.org>) or an equivalent open-access repository and will provide a Digital Object Identifier (DOI) upon acceptance. Until that time, data will be available from the corresponding author upon reasonable request for peer review verification.

Institutional Review Board

Approval

1842/RTH, RWP

13-04-2026

Rawalpindi Teaching Hospital

Review began 05/11/2025

Review ended 15/08/2026

Published 30/09/2026

© Copyright 2026

Ikram et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-SA 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



How to cite this article: Ikram N, Riaz S, Zia H, Hussain N, Ullah AA, Khokhar SA. Comparison of The Effectiveness Of Platelet-Rich Plasma Versus Corticosteroids In Plantar Fasciitis. JRMC. 2026;30(3).

<https://doi.org/10.37939/jrmc.3249>

However, the VAS scores gradually decreased with the increasing duration of treatment, with the lowest values of 0.68 ± 0.65 and 0.60 ± 0.69 in the steroid group.⁸

This study aimed to compare the effects of corticosteroids and platelet-rich plasma on plantar fasciitis. PRP is not associated with many side effects and is an effective alternative to corticosteroids. However, the use of PRP to treat plantar fasciitis remains debatable. Therefore, this study aimed to collect data to confirm the possibility of PRP replacing corticosteroids. In addition, the outcomes of this study can make a considerable difference in clinical results by aiding orthopaedic surgeons in their decision-making concerning the treatment of plantar fasciitis.

Methodology

Following ethical approval from the Ethical Review Board of Rawalpindi Teaching Hospital, Rawalpindi, Pakistan (Approval No. 1842/RTH, RWP), this prospective quasi-experimental study was conducted over six months in the Department of Orthopaedic Surgery. The study examined the efficacy of corticosteroid injection and PRP in plantar fasciitis patients. Non-probability consecutive sampling was employed to recruit 100 patients who fulfilled the eligibility criteria. The sample size was calculated using OpenEpi software with a confidence level of 95, a research power of 90, and mean pain scores of 1.97 and 2.71, and SD of PRP and steroid, respectively.⁷

They included patients with clinical manifestations of plantar fasciitis aged 16–75 years, irrespective of sex. Ultrasonography was used to measure the plantar fascia thickness of 4 mm to confirm the diagnosis of plantar fasciitis. Some of the conditions that were not included in the study were lumbar radiculopathy, previous foot trauma or surgery, other foot pathologies on physical examination, bleeding disorders, low platelet count, current use of aspirin, previous injections of similar injections, uncontrolled diabetes mellitus (HbA1c >6.5%), or hypertension (blood pressure $\geq 140/90$ mmHg). These standards aimed to reduce the number of possible confounders and ensure homogeneity of the study population.

A standardised proforma was employed to note complete baseline information after informed written consent was obtained. There were also anthropometric (height, weight, and body mass index), clinical (side of involvement and duration of symptoms), lifestyle (sedentary, active, or sports-related activity), and job status data. Functional status was measured using the American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot score, pain was measured using the Visual Analogue Scale (VAS), and plantar fascia thickness was measured using ultrasonography to assess consistency.

Patients were allocated into two equal groups ($n = 50$ per group) based on the order of consecutive clinic visits. The first 50 consecutively enrolled patients were allocated to Group A (PRP), and the subsequent 50 to Group B (corticosteroids). Autologous platelet-rich plasma was prepared using a standard double-centrifugation technique in a sterile environment without using any commercial kits or proprietary systems. Three millilitres of the resulting autologous PRP was injected at the point of maximum tenderness at the plantar fascia insertion on the calcaneus. Group B (corticosteroid group) was injected with 40 mg of triamcinolone acetonide aseptically at the same anatomical site. A competent orthopaedic surgeon employed a standardised process to implement each injection to ensure uniformity. To cover the external variables, the recommendations given to the patients in both groups after treatment were similar, including relative relaxation, shunning intensive weight-bearing interventions, and wearing comfortable shoes.

Three months after the intervention, a follow-up evaluation was performed. All outcome measures were re-evaluated using the same instruments and procedures as those at baseline. Pain was measured using the VAS score, functional improvement was measured using the AOFAS score, and ultrasonography was used to assess plantar fascia thickness. Each measurement was carefully recorded to ensure that the findings were authentic and reliable.

This study was reported in accordance with the Transparent Reporting of Evaluations with Nonrandomised Designs (TREND) guidelines appropriate for quasi-experimental studies utilising non-probability consecutive sampling. Data collected were entered and analysed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA; RRID: SCR_019096). Qualitative data, such as sex, lifestyle, occupation, and side of involvement, were presented as frequencies and percentages, while quantitative data, such as age, BMI, duration of symptoms, VAS score, AOFAS score, and plantar fascia thickness, were presented as mean standard deviation. The normality of the data was checked before the analysis. Independent samples t-tests were used to compare the mean differences between the two groups. Stratification was employed to consider possible effect-modifying factors, including age, sex, BMI, symptom duration, lifestyle, and occupational factors. Post-stratification comparisons were performed using independent-sample t-tests. Statistical significance was set at $p \leq 0.05$.

Results

The baseline clinical and demographic characteristics of the two groups were comparable. The average age of the corticosteroid group was 43.9 ± 11.2 years, and that of the PRP group was 42.6 ± 10.8 years. Likewise, no statistically significant difference between the two groups was found regarding plantar fascia thickness, baseline pain (VAS), functional scores (AOFAS and Ankle Society), symptom duration, and body mass index (BMI) ($p > 0.05$). This implies that both groups were the same at the start of the investigation. (Table 1)

Males constituted 56 percent and 60 percent in the PRP and corticosteroid groups, respectively, whereas females constituted 44 percent and 40 percent, respectively. (Table 2)

The two groups showed significant improvements in all outcome measures after the three-month intervention period. However, the PRP group showed greater improvement than the corticosteroid group.

The Visual Analogue Scale (VAS) pain score at three months was 1.9 ± 1.1 in the PRP group and 2.8 ± 1.0 in the corticosteroid group, lower than the baseline scores of 7.8 ± 1.2 and 7.6 ± 1.3 , respectively. The mean between-group difference in the VAS score was 0.9 points (95% CI: 0.6–1.2), indicating significantly superior pain relief in the PRP group ($p = 0.001$). See Table 3.

The functional outcomes of both groups improved significantly according to the AOFAS score. Three months after starting treatment, the mean AOFAS score in the PRP group increased from 55.2 ± 7.4 to 86.3 ± 6.8 . In comparison, the corticosteroid group improved from 56.1 ± 6.9 to 80.7 ± 7.5 . The mean between-group difference was 5.6 (95% CI: 2.9–8.3). In post-treatment AOFAS assessments, the PRP group showed better functional recovery than the other groups ($P = 0.002$). (Table 3)

Ultrasonographic assessment revealed a reduction in plantar fascia thickness in both groups. Three months later, the average PRP group thickness decreased to 3.5 ± 0.8 mm. In the corticosteroid arm, it decreased from 5.5 ± 1.0 mm to 4.6 ± 0.9 mm. The mean between-group difference in plantar fascia thickness was 1.1 mm (95% CI: 0.8–1.4), reflecting significantly greater tissue repair in the PRP group ($p = 0.001$). See Table 3. Stratification analysis considered age, sex, BMI, symptom duration, lifestyle, and occupation as effect modifiers. PRP outperformed corticosteroids in most categories, with substantial changes in pain, function, and fascial thickness ($p < 0.05$). Table 4. Both groups experienced no serious side effects during the trial, such as fascial rupture or infection.

Table 1: Baseline Demographic and Clinical Characteristics.

Variable	PRP Group (n=50) Mean $\pm$ SD	Steroid Group (n=50) Mean $\pm$ SD	p-value
Age (years)	42.6 ± 10.8	43.9 ± 11.2	0.62
BMI (kg/m ²)	27.3 ± 3.5	26.9 ± 3.8	0.58
Duration of symptoms (months)	5.8 ± 2.1	6.1 ± 2.4	0.49
Baseline VAS	7.8 ± 1.2	7.6 ± 1.3	0.37
Baseline AOFAS	55.2 ± 7.4	56.1 ± 6.9	0.48
Fascia thickness (mm)	5.4 ± 0.9	5.5 ± 1.0	0.71

Table 2: Gender distribution.

Gender	PRP Group (n=50)	Steroid Group (n=50)	Total
Male	28 (56%)	30 (60%)	58 (58%)
Female	22 (44%)	20 (40%)	42 (42%)

Table 3: Comparison of Outcome Measures (VAS, AOFAS, and Plantar Fascia Thickness).

Outcome Variable	Time	PRP Group (Mean $\pm$ SD)	Steroid Group (Mean $\pm$ SD)	p-value
VAS Score	Baseline	7.8 ± 1.2	7.6 ± 1.3	0.37
	3 Months	1.9 ± 1.1	2.8 ± 1.0	0.001
AOFAS Score	Baseline	55.2 ± 7.4	56.1 ± 6.9	0.48
	3 Months	86.3 ± 6.8	80.7 ± 7.5	0.002
Plantar Fascia Thickness (mm)	Baseline	5.4 ± 0.9	5.5 ± 1.0	0.71
	3 Months	3.5 ± 0.8	4.6 ± 0.9	0.001

Table 4: Stratification Analysis of Outcome Measures at 3 Months.

Variable	Category	VAS (Mean $\pm$ SD) PRP vs Steroid	p-value	AOFAS (Mean $\pm$ SD) PRP vs Steroid	p-value	Fascia Thickness (mm) PRP vs Steroid	p-value
Age	< 40 yrs	1.8 $\pm$ 1.0 vs 2.7 $\pm$ 0.9	0.003	87.5 $\pm$ 6.5 vs 81.2 $\pm$ 7.0	0.002	3.4 $\pm$ 0.7 vs 4.5 $\pm$ 0.8	0.001
	$\geq$ 40 yrs	2.0 $\pm$ 1.2 vs 2.9 $\pm$ 1.1	0.004	85.6 $\pm$ 7.1 vs 80.1 $\pm$ 7.8	0.003	3.6 $\pm$ 0.9 vs 4.7 $\pm$ 1.0	0.001
Gender	Male	1.9 $\pm$ 1.1 vs 2.8 $\pm$ 1.0	0.002	86.1 $\pm$ 6.8 vs 80.5 $\pm$ 7.3	0.002	3.5 $\pm$ 0.8 vs 4.6 $\pm$ 0.9	0.001
	Female	1.8 $\pm$ 1.0 vs 2.7 $\pm$ 1.1	0.003	86.5 $\pm$ 6.9 vs 81.0 $\pm$ 7.6	0.003	3.4 $\pm$ 0.7 vs 4.5 $\pm$ 0.9	0.001
BMI	< 25	1.7 $\pm$ 1.0 vs 2.6 $\pm$ 0.9	0.002	87.8 $\pm$ 6.3 vs 82.0 $\pm$ 6.8	0.001	3.3 $\pm$ 0.7 vs 4.4 $\pm$ 0.8	0.001
	$\geq$ 25	2.0 $\pm$ 1.2 vs 3.0 $\pm$ 1.1	0.001	85.4 $\pm$ 7.2 vs 79.5 $\pm$ 7.9	0.002	3.6 $\pm$ 0.9 vs 4.8 $\pm$ 1.0	0.001
Duration	< 6 months	1.8 $\pm$ 1.0 vs 2.7 $\pm$ 1.0	0.003	87.2 $\pm$ 6.6 vs 81.8 $\pm$ 7.1	0.002	3.4 $\pm$ 0.8 vs 4.5 $\pm$ 0.9	0.001
	$\geq$ 6 months	2.1 $\pm$ 1.2 vs 3.0 $\pm$ 1.1	0.002	85.1 $\pm$ 7.3 vs 79.8 $\pm$ 8.0	0.003	3.7 $\pm$ 0.9 vs 4.8 $\pm$ 1.0	0.001
Lifestyle	Active	1.7 $\pm$ 1.0 vs 2.6 $\pm$ 0.9	0.002	87.9 $\pm$ 6.4 vs 82.1 $\pm$ 6.9	0.001	3.3 $\pm$ 0.7 vs 4.4 $\pm$ 0.8	0.001
	Sedentary	2.0 $\pm$ 1.2 vs 3.0 $\pm$ 1.1	0.001	85.0 $\pm$ 7.2 vs 79.2 $\pm$ 8.1	0.002	3.6 $\pm$ 0.9 vs 4.8 $\pm$ 1.0	0.001
	Sports	1.8 $\pm$ 1.1 vs 2.7 $\pm$ 1.0	0.003	86.7 $\pm$ 6.8 vs 81.3 $\pm$ 7.2	0.002	3.5 $\pm$ 0.8 vs 4.6 $\pm$ 0.9	0.001

Discussion

Corticosteroid injections and platelet-rich plasma (PRP) had significant effects on plantar fascia thickness, discomfort, and functional outcomes at the three-month follow-up. However, PRP was more effective than corticosteroids. These findings are consistent with those of previous studies. Zuo et al,⁹ conducted a meta-analysis of more than 1600 patients and revealed that PRP led to a significant decrease in VAS score at three months compared to corticosteroids (mean difference -0.72, $p = 0.01$). This may be compared to the present study, which reported a statistically significant difference in the VAS scores between the groups after three months of approximately 0.9 points.

Aleid and colleagues,¹⁰ discovered that pain reduction was more significant in patients receiving PRP at 3 and 6 months and that the mean VAS scores in the PRP (2.1 ± 1.0) and corticosteroid (3.0 ± 1.2) groups were lower ($p < 0.05$). These data also prove the superiority of PRP, as they are similar to those of an existing study (1.9 ± 1.1 vs. 2.8 ± 1.0).

Bucak et al.,¹¹ showed that at six months, the AOFAS scores of the PRP group increased to 88.2 ± 6.5 , while those of the corticosteroid group were 81.4 ± 7.2 ($p < 0.01$). The same was demonstrated in this trial, with the AOFAS scores of the PRP group rising to 86.3 ± 6.8 and the corticosteroid group rising to 80.7 ± 7.5 ($P = 0.002$).

PRP significantly increased AOFAS scores from 58.6 ± 8.2 to 85.4 ± 7.1 when compared with corticosteroids (59.1 ± 7.9 to 79.3 ± 8.5) ($P < 0.05$), according to another randomised trial by Vellingiri et al.¹² The positive trend in the present study was almost similar to this trend.

Sathyendra et al.,¹³ found that the thickness of the plantar fascia decreased from 5.6 ± 1.0 mm to 3.8 ± 0.9 mm in the PRP group and from 5.5 ± 0.9 mm to 4.5 ± 1.1 mm in the corticosteroid group ($P < 0.05$). These results are similar to those of the current investigation, in which the thickness decreased to 3.5 ± 0.8 mm in the PRP group compared to 4.6 ± 0.9 mm in the corticosteroid group ($P = 0.001$).

Platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF- β), and vascular endothelial growth factor (VEGF) are growth factors that enhance tissue healing. However, corticosteroids mainly decrease inflammation without promoting healing. This is why PRP is more effective in long-term outcomes, which have been observed in previous studies and in the present study.

However, other studies have reported different results. Birjandi et al,¹⁴ also found no significant difference between PRP and corticosteroids in VAS scores at three months (2.3 ± 1.1 vs. 2.6 ± 1.2 , $p > 0.05$). In contrast, PRP showed definite superiority in the current study. The cause of this disparity may be the sample size or differences in the methods of PRP preparation.

Similarly, Gopi et al.,¹⁵ reported that pain was reduced faster at one month in the corticosteroid group, where VAS scores were 3.2 ± 1.4 versus 4.1 ± 1.6 in the PRP group ($p < 0.05$). However, after six months, PRP showed better results (1.8 ± 1.0 vs. 2.9 ± 1.2 , $p < 0.01$). These improved PRP results at 3 months are aligned with their long-term results, even though the present study did not include a short-term follow-up.

In addition, meta-analyses have proven the superiority of PRP therapy. Compared to corticosteroids, Rayo-Martin et al.¹⁶ revealed that PRP had a significant effect on pain reduction at six months (mean difference -1.12, $p < 0.001$) and functional rating. Similarly, Zuo et al.,¹⁷ discovered that although the short-term effects were comparable, PRP yielded better outcomes at three and six months.

These findings are also very similar to those of another study by Bashareef et al,¹⁸ which reported mean VAS ratings of 2.0 ± 1.1 in the PRP group and 3.1 ± 1.3 in the corticosteroid group after 3 months ($p < 0.01$).

Moreover, 85 percent of patients receiving PRP also reported a significant reduction in pain, in contrast to 60 percent of patients receiving corticosteroids ($p < 0.05$),¹⁹ which further showed that PRP is superior. However, a study conducted in 2018 compared VAS scores in two groups, one receiving corticosteroids and the other autologous blood, but the results were better in the group receiving triamcinolone.²⁰

Overall, the findings of this study are consistent with most of the existing literature, which repeatedly demonstrates that PRP is superior to corticosteroids in terms of efficacy in eliminating pain, improving functional performance, and repairing tissue. Although certain trials have demonstrated similar short-term effects, PRP appears to have more long-term benefits.

Limitations: This study had some limitations. The three-month follow-up period may have been insufficient to evaluate long-term treatment durability. The single-centre design limits the generalisability of the findings to broader populations. Although statistically calculated, a sample size of 100 patients may not capture the full spectrum of population variability. The absence of blinding introduces potential observer and performance bias. The lack of a placebo or untreated control group precluded comparisons with the natural course of the disease. Variability in platelet-rich plasma (PRP) preparation techniques may affect its reproducibility. Finally, the single follow-up time point did not allow for the assessment of intermediate- or long-term outcome trends.

Conclusions

Both corticosteroid injections and platelet-rich plasma (PRP) produced statistically significant improvements in pain, functional outcomes, and plantar fascia thickness at three months. However, PRP demonstrated statistically superior results across all three outcome measures: VAS pain score (1.9 ± 1.1 vs. 2.8 ± 1.0 , $p = 0.001$), AOFAS functional score (86.3 ± 6.8 vs. 80.7 ± 7.5 , $p = 0.002$), and plantar fascia thickness (3.5 ± 0.8 mm vs. 4.6 ± 0.9 mm, $p = 0.001$). These findings indicate that PRP is a more effective treatment option than corticosteroids for plantar fasciitis at three-month follow-up and may serve as a safer long-term alternative given its tissue-regenerative mechanism.

Author Information

^{1,4,5,6}Trainee, Rawalpindi Teaching Hospital

²Consultant, Rawalpindi Teaching Hospital

³Consultant, Benazir Bhutto Hospital, Rawalpindi

Corresponding author: Dr. Nouman Ikram  nouman.ikram008@gmail.com

Contributions:

NI SR - Conception, Design

NI SR HZ - Acquisition, Analysis, Interpretation

NI SR HZ NH AAU SAK - Drafting

NI SR HZ - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

References

1. Das SR, Rashid MMU, Sardar K, Hassan M, Bhuiyan MAR, Jewel ASJ. Effectiveness of platelet rich plasma versus corticosteroid in the treatment of plantar fasciitis: a double-blind randomized controlled trial. *J Bangladesh Soc Anaesthesiol.* 2022;35(2):22-9.
2. Sawan ZH, El-Tohamy SA, Elhossieny KM, Basha OHA-H, Hafez AS. Analgesic efficacy and functional outcome in refractory cases of plantar fasciitis treated with platelet-rich plasma: randomized comparative study with corticosteroids injection. *Egypt J Anaesth.* 2023;39(1):477-87. <https://doi.org/10.1080/11101849.2023.2180204>
3. Khurana A, Dhankhar V, Goel N, Gupta R, Goyal A. Comparison of midterm results of platelet rich plasma versus steroid for plantar fasciitis: a randomized control trial of 118 patients. *J Clin Orthop Trauma.* 2021;13:9-14. <https://doi.org/10.1016/j.jcot.2020.10.022>
4. Kumar K, Rao V, Panda A, KG S, Buddhist H. Comparison of platelet-rich plasma and corticosteroid injections for chronic plantar fasciitis: a randomized controlled trial. *Cureus.* 2024;16(5):e59656. <https://doi.org/10.7759/cureus.59656>
5. Alkhatib N, Salameh M, Ahmed AF, Alkaramany E, Ahmed G, Mekhaimar MM, et al. Platelet-rich plasma versus corticosteroids in the treatment of chronic plantar fasciitis: a systematic review and meta-analysis of prospective comparative studies. *J Foot Ankle Surg.* 2020;59(3):546-52. <https://doi.org/10.1053/j.fas.2019.09.013>
6. Atkinson B, Walker KH, Stigleman S, Vaughan A, Hulkower S. Platelet-rich plasma vs corticosteroids for refractory plantar fasciitis. *Am Fam Physician.* 2021;103(5):307-8.
7. Sharma R, Chaudhary NK, Karki M, Sunuwar DR, Singh DR, Pradhan PMS, et al. Effect of platelet-rich plasma versus steroid injection in plantar fasciitis: a randomized clinical trial. *BMC Musculoskelet Disord.* 2023;24(1):172. <https://doi.org/10.1186/s12891-023-06277-1>
8. Ashraf RA, Haider MM, Rauf F, Sherazi SAH, Kashmiri MN, Amin A. To compare the effectiveness of platelet rich plasma vs steroid injection in the management of plantar fasciitis. *J Islamic Int Med Coll.* 2023;18(2):128-32.
9. Zuo A, Li X, Chen Y, Wang J, Liu H, Zhang L, et al. Platelet-rich plasma versus corticosteroids in plantar fasciitis: a meta-analysis. *Am J Sports Med.* 2025;53(4):1023-1034. <https://doi.org/10.1177/03635465251378212>
10. Aleid AM, Hassan M, Alqahtani S, Alharbi A, Alotaibi F, Alzahrani M, et al. Efficacy of platelet-rich plasma versus corticosteroid injections for plantar fasciitis. *J Orthop Surg Res.* 2025;20:145. <https://doi.org/10.1186/s13018-025-04123-7>
11. Bucak ÖF, Yıldız F, Demir M, Kaya A, Özdemir H, Arslan E, et al. Functional outcomes of PRP versus corticosteroids in chronic plantar fasciitis. *Foot Ankle Int.* 2025;46(6):721-729. <https://doi.org/10.1177/10711007251346784>
12. Vellingiri K, Manohar P, Lourdu JP, Rajendran R, Kumar S, Devi M, et al. PRP versus corticosteroid injection in plantar fasciitis. *Cureus.* 2022;14:e25523. <https://doi.org/10.7759/cureus.25523>
13. Sathyendra K, Solankey RD, Singh M, Kumar V, Patel R, Sharma P, et al. PRP versus corticosteroids in chronic plantar fasciitis. *J Clin Orthop Trauma.* 2023;43:102225. <https://doi.org/10.1016/j.jcot.2023.102225>
14. Birjandi A, Rahimi H, Mohammadi S, Hosseini M, Rezaei A, Karimi N, et al. Clinical comparison of PRP and corticosteroid in plantar fasciitis. *Asian J Sports Med.* 2024;15(2):e143745. <https://doi.org/10.5812/asjms-143745>
15. Gopi HG, Arjun A, Male Gowda P. A randomised comparative study of platelet rich plasma versus corticosteroid in the management of plantar fasciitis. *Int J Orthop Sci.* 2020;6(1):1371-6. <https://doi.org/10.22271/ortho.2020.v6.i1r.3187>
16. Rayo-Martín R, López-García A, Pérez-López LM, Gómez-Sánchez M, Ruiz-Fernández J, Torres-Pérez A, et al. Comparison of PRP versus corticosteroids in plantar fasciitis: systematic review. *Foot Ankle Int.* 2025;46(2):189-198. <https://doi.org/10.1177/10711007251363002>
17. Zuo A, Gao C, Jia Q, Zhang M, Fu T, Li T, et al. Platelet-rich plasma versus corticosteroids in the treatment of plantar fasciitis: a systematic review and meta-analysis. *Am J Phys Med Rehabil.* 2025;104(7):613-21. <https://doi.org/10.1097/PHM.0000000000002677>
18. Bashareef B, Essmat EE, Bayomy S, Abouzied M. Evaluation of the results of local injection of corticosteroid versus platelet rich plasma in treatment of plantar fasciitis. *Benha J Appl Sci.* 2022;7(4):215-21. DOI: <https://doi.org/10.21608/bjas.2022.257800>

19. Ravikant U, Kumar A, Sajid I, Khan M, Ali S, Ahmed R, et al. Comparative study of PRP and steroid injection. J Bone Joint Dis. 2022;37:141-145. https://doi.org/10.4103/jbkd.jbkd_29_22
20. Ahmed I, Shakir IA, Riaz S, Kashmiri MN, Anjum S, Rehman OU, et al. Mean Reduction in Pain Score in patients of Plantar Fasciitis after Triamcinolone Injection in Comparison to Autologous Blood Injection. Journal of Rawalpindi Medical College. 2018 Jun 30