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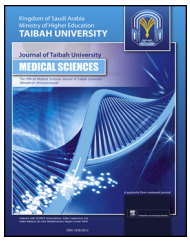

Review Article

Efficacy of platelet-rich plasma versus corticosteroid injections in recovery from plantar fasciitis: A systematic review and meta-analysis

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الملخص

أهداف البحث: التهاب اللفافة الأخمصية المزمن هو اضطراب تنكسي ناتج عن آلام الكعب وعدم الراحة لفترات طويلة. قد يشكل هذا المرض المزمن طويل الأمد تحديا كبيرا بين المرضى المصابين بالتهاب اللفافة الأخمصية في الإدارة السريرية. فيما يتعلق بخيارات العلاج، لا تزال المقارنة النسبية بين البلازما الغنية بالصفائح الدموية وحقن الكورتيكوستيرويد غير واضحة. تهدف هذه المراجعة المنهجية والتحليل التلوي إلى تقييم نتائج البلازما الغنية بالصفائح الدموية مقارنة بحقن الكورتيكوستيرويد من حيث تخفيف آلام التهاب اللفافة الأخمصية المزمن وإدارة وظائف المرضى.

طريقة البحث: اتبعت هذه المراجعة المنهجية عناصر الإبلاغ المفضلة للمراجعات المنهجية والتحليل التلوي. المبادئ التوجيهية لمقارنة خيارين علاجيين مختلفين لالتهاب اللفافة الأخمصية المزمن. على وجه الخصوص، تم تقييم المقارنة بين البلازما الغنية بالصفائح الدموية وحقن الكورتيكوستيرويد باستخدام مقياس التناظر البصري ودرجة الجمعية الأمريكية لجراحة العظام والقدم والكاحل من حيث الألم والوظيفة. باستخدام أداة (آر اوه بي-2)، تم تقييم جودة الدراسة باستخدام كل من نماذج التأثيرات الشائعة والعشوائية التي يتم تطبيقها لتقييم الاختلافات بين المرضى. تم تضمين ثماني دراسات شملت 599 مشاركا. باستخدام مقياس التناظر البصري، تم تقييم الألم؛ بينما تم تحديد الوظيفة من خلال درجة الجمعية الأمريكية لجراحة العظام والقدم والكاحل.

النتائج: أظهرت الدراسة نتائج مختلطة لتخفيف الألم: بينما أشار نموذج التأثير الشائع إلى ميزة كبيرة للبلازما الغنية بالصفائح الدموية، لم يظهر نموذج التأثيرات العشوائية أي فرق كبير. فضل كل من نموذجي التأثيرات الشائعة والعشوائية البلازما الغنية بالصفائح الدموية لتحسين الوظيفة مع تباين معتدل.

الاستنتاجات: من خلال نتائج الجمعية الأمريكية لجراحة القدم والكاحل، تشير النتائج إلى أن البلازما الغنية بالصفائح الدموية يمكن أن توفر تحسنا وظيفيا وتسكينا للألم مقارنة بالكورتيكوستيرويدات لالتهاب اللفافة الأخمصية المزمن. في حين تتطلب الاختلافات في الدراسة تفسيرا دقيقا، فإن الميزة الثابتة للبلازما الغنية بالصفائح الدموية في الوظيفة تسلط الضوء على وعدها كخيار علاجي قيم. يوصى بإجراء المزيد من البحث باستخدام بروتوكولات موحدة، ومتابعة ممتدة، وسكان أكبر وأكثر تنوعا لإثبات إمكانات البلازما الغنية بالصفائح الدموية ودعم دمجها في الممارسة السريرية.

الكلمات المفتاحية: التهاب اللفافة الأخمصية المزمن؛ البلازما الغنية بالصفائح الدموية؛ حقن الكورتيكوستيرويد؛ تسكين الآلام؛ الجمعية الأمريكية لجراحة القدم والكاحل؛ المقياس التناظري البصري؛ المراجعة المنهجية.

Abstract

Introduction: Chronic plantar fasciitis (CPF) is a degenerative condition causing persistent heel pain, making clinical management challenging. Among treatment options, the comparative effectiveness of platelet-rich plasma (PRP) and corticosteroid injections (CSIs) remains unclear. This systematic review and meta-analysis evaluate their impact on pain relief and functional improvement.

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Methods: Following PRISMA guidelines, this review analyzed eight studies involving 599 participants. Pain and function were assessed using the Visual Analog Scale (VAS) and the American Orthopaedic Foot & Ankle Society (AOFAS) score. Study quality was evaluated using the Risk of Bias 2 tool, and both common- and random-effects models were applied.

Results: Pain relief results were mixed. The common-effects model favored PRP (MD = −0.7166), but the random-effects model showed no significant difference (MD = 0.4657). For functional improvement, both models indicated PRP as superior (AOFAS score: MD = 16.13, 95% CI [14.70, 17.55]), with moderate variability (I^2 = 48.7%).

Conclusions: PRP shows promise in improving function and potentially providing better pain relief compared to CSIs for CPF. While study variability requires careful interpretation, PRP's functional benefits support its potential as a valuable treatment. Further research with standardized protocols and diverse populations is needed to confirm its clinical effectiveness.

Keywords: American orthopaedic foot & ankle society; Chronic plantar fasciitis; Corticosteroid injections; Pain relief; Platelet-rich plasma; Systematic review

Introduction

Plantar fasciitis (PF) is one of the most causes of heel pain, which results from degenerative stress at the origin of the PF, causing intense, concentrated heel discomfort and pain. Despite being named after inflammation, PF is considered a chronic degenerative disorder that is important for supporting the arch and absorbing shock.[1] PF is mainly associated with repetitive mechanical stress from physical activities such as prolonged standing, weight bearing, or running, causing microtears within the PF. This progressive stretching and degeneration result in collagen breakdown at the fascia's attachment point, often causing persistent pain, even at rest. Additional contributory factors include vascular and metabolic disturbances, oxidative stress, hyperthermia, genetic predisposition, and degenerative changes in the heel fat pad, particularly in patients with rheumatoid arthritis and spondyloarthropathies.[2,3]

Although commonly seen in runners, PF constitutes 11–15 % of adult foot complaints requiring medical attention, particularly affecting middle-aged, overweight females (40–60 years). Furthermore, heel spurs—a form of soft tissue ossification—are frequently observed in patients with heel pain, with reported prevalence rates between 30 % and 70 %.[3]

PF can be treated non-surgically by rest, massages, anti-inflammatory drugs, splints, orthotic devices, injections, physiotherapy, and even casting. Also, treatment commonly includes high-load strength training, involving single-legged heel raises with a rolled towel under the forefoot to engage the windlass mechanism and apply targeted mechanical stress to the PF. Patients are required to perform this exercise every day on a step with balance support to optimize adherence and individualized load tolerance. Despite these non-surgical managements, persistent discomfort and pain may still appear in patients suffering from PF.[3,4] As a result, surgical intervention may be considered for patients with persistent, severe symptoms that are unresponsive to conservative measures, making this cohort distinct from initial presentations of PF. In these instances, a percutaneous method is used with the patient under local anesthesia. After giving anesthesia and vasoconstrictors, 25 K-wires are inserted in the affected area, and then radiofrequency energy is applied to the fascia surface and inside with continuous water cooling. After surgery, it is important to slowly resume weight-bearing activities, with suggestions for 7 days of light activity, 14 days of moderate, and 4 weeks of high-intensity tasks. An orthopedic surgeon specializing in radiofrequency microtenotomy performs this procedure, offering a precise and advanced solution for cases that do not respond to traditional treatment.[4,5]

Corticosteroid injections (CSIs) are frequently used for the management of PF to provide immediate, short-term pain relief by targeting inflammation in the affected area initially. However, CSI effects are typically transient and less beneficial for sustained pain relief and functional improvement compared to other alternative therapies such as platelet-rich plasma (PRP), which is generated by advances in molecular biology as a new treatment method.[6,7] Recent studies suggest it is a promising option for treating PF by delivering growth factors and cytokines that aid in local healing.[8] As a result, while steroid injections are commonly used after conservative treatments fail, PRP injections are increasingly preferred for their superior safety profile and longer lasting therapeutic effects rather than short-term use.[9,10]

Despite the fact that both PRP and CSIs are effective in managing PF, existing research is notably fragmented. To address this gap, a systematic review and meta-analysis were conducted in this study to assess the efficacy of PRP for pain relief in patients with CPF compared with patients using CSIs to detect the most effective treatment strategy for pain management within this patient population.

Methods

A systematic review and meta-analysis[11] were conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist.[12] In this detailed analysis, only randomized clinical trials and subsequent cohort studies comparing the efficacy of PRP injections to CSIs used for CPF management were evaluated. This strict methodology allowed for a systematic collection and analysis of relevant data, providing meaningful insights of these two treatment strategies for CPF outcomes. The study was registered with PROSPERO (CRD42024547752).

Literature search

We conducted a comprehensive search across electronic databases, including PubMed, Scopus, Web of Science, Cochrane Library, and Google Scholar. The search strategy used was "chronic plantar fasciitis," "platelet-rich plasma," and "corticosteroid" will be used in various combinations, with an English language restriction. This limitation was imposed due to language restrictions. Our systematic review and meta-analysis specifically focused on peer-reviewed randomized controlled trials (RCTs) and cohort studies. Initial search results were screened based on titles and abstracts for relevance to the research question. Studies that appeared to meet the inclusion criteria had their full texts reviewed. This process resulted in the final inclusion of a total of 8 RCTs encompassing 599 patients in the meta-analysis.

Inclusion and exclusion criteria

Only studies that involved patients who are diagnosed with CPF and compared the effectiveness of PRP and corticosteroid treatments in managing their heel pain were included. These outcomes of pain and functional assessments were detected by using Visual Analog Scale (VAS) and American Orthopaedic Foot & Ankle Society (AOFAS) scores. Only RCTs were considered. We excluded studies that focused on any pain other than heel pain or utilized interventions beyond PRP and CSI therapy. Also, studies that lacked clear treatment outcome data, or were case reports, editorials, reviews, or animal studies were excluded.

Study screening and selection

Two authors conducted the literature search and both of them assessed each article in full. Discrepancies or differences in any opinion that arose during the assessment process were resolved through mutual consultation. The selection of studies for final analysis followed the PRISMA flowchart, without restrictions on sex, geographic location, or race, allowing for a comprehensive assessment across different patient groups. Each author independently screened articles depending on set inclusion and exclusion criteria. Both authors agreed to reach a consensus when needed to minimize conflicts.

Data extraction

The data extraction was conducted by two independent investigators. The extracted information encompassed study characteristics, participant details, intervention specifics, outcome measures, and funding sources. For quantitative data, mean difference (MD) and standard deviation (SD) were used. Regarding missing data, we made efforts to obtain them and calculate MDs (SD) from the original studies.

Quality and risk of bias (RoB) assessment using the RoB 2 tool

The quality of the studies was appraised independently by two investigators. We assessed the RoB in the included studies using the Cochrane RoB tool for RCTs.[13] This tool helps mitigate bias, thereby enhancing evidence-based decision-making. The final evaluation provided a detailed overview of the methodological rigor of the included studies.

Outcomes measured

The study primarily measured pain and function outcomes to assess the impact of the intervention. The focus was on pain (VAS) and function (AOFAS), with secondary measures looking at heel health at post-treatment follow-ups.

Statistical analyses and heterogeneity

Statistical analyses and heterogeneity were performed by two authors. Both authors thoroughly assessed the full papers, and any discrepancies or disagreements that arose during the evaluation were resolved through a consensus reached between the two authors. We reported our selection process in the PRISMA diagram flowchart. There were no restrictions on sex, location, or ethnicity, allowing a comprehensive examination across diverse patient groups. Studies were selected based on the predefined inclusion and exclusion criteria by two independent authors. Any disagreement was settled by consensus among all authors.

Results

Literature search

The literature search yielded 219 records, of which 38 were duplicates and subsequently removed. Of the remaining 181 articles, titles and abstracts were screened at a second evaluation level, resulting in the exclusion of 153 irrelevant records. Following a full-text review to assess eligibility, an additional 20 of the 28 remaining articles were excluded. Ultimately, 8 studies met the predefined inclusion criteria and were selected for the analyses. The systematic approach to identification and inclusion of studies is illustrated in Figure 1 below.

Study characteristics

Eight studies [14–17, 21–24] included 599 patients who had PRP and CSIs for heel pain management representing diverse global regions and offering a comprehensive perspective on the target population. Interventions varied across studies, focusing on comparative analyses of PRP and corticosteroid efficacy, with outcomes for pain and function evaluated using specific assessment tools. A summary of study characteristics is provided in Table 1.

Key findings of the included studies

The literature reviewed highlights and important insights into the effectiveness of CSIs and PRP injections for PF treatment. CSIs show effectiveness for short-term pain relief and functional gains; however, these benefits are limited over time. By contrast, PRP injections yield more favorable results, providing greater pain reduction, improved function, and extended duration of relief. Additionally, PRP

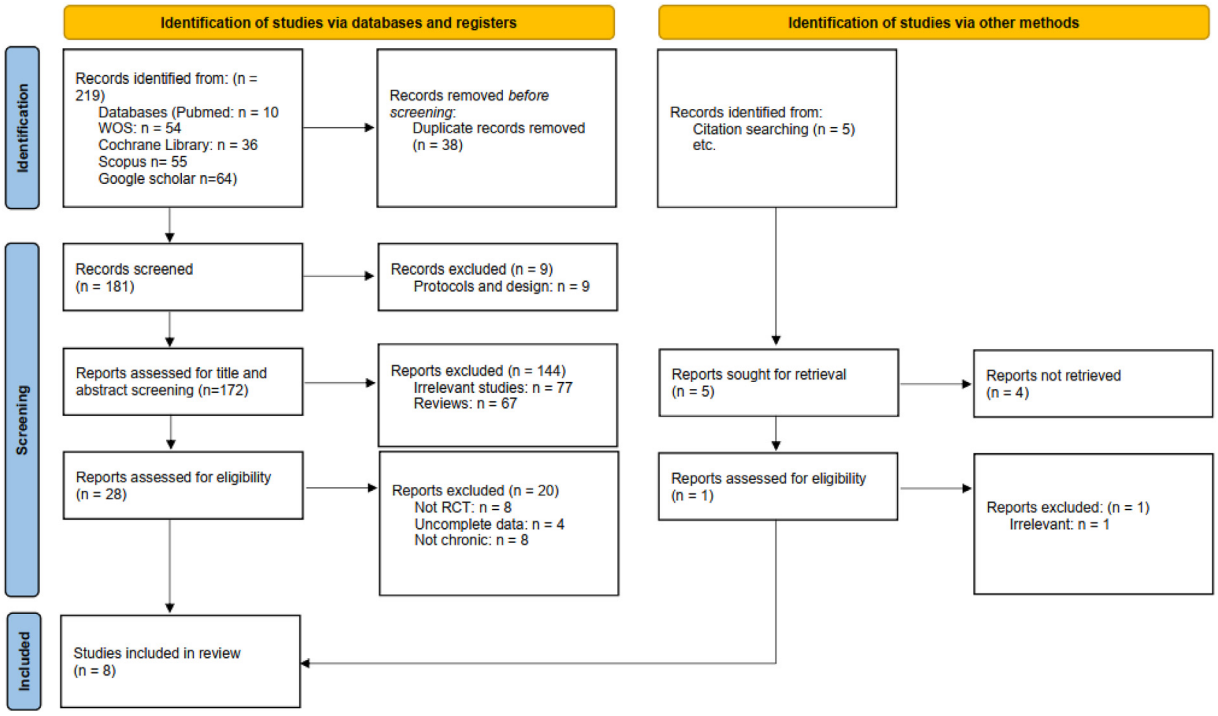

Figure 1: PRISMA flow chart of the included studies.

Table 1: Demographic characteristics of the included studies

Studies	Country	Number of participants (N =)		Mean age of cases (SD)	Mean age of control (SD)	Gender of cases Female/ Male %	Gender of control Female/Male %	Follow-up
		PRP	Corticosteroid	PRP	Corticosteroid	PRP	Corticosteroid	
Soraganvi et al.[18]	India	29	28	40.27 (−8.03)	38.35 (12.5)	52/48 %	43/57 %	6 Months
Uğurlar et al.[17]	Turkey	39	40	38.4 (19−58)	40.1 (21−56)	51.3/48.7 %	50/50 %	36 Month
Peerbooms et al.[13]	Netherland	63	52	50.73 (11.33)	47.5 (11.19)	76.2/23.8 %	65.4/34.6 %	12 Months
Hafez et al.[19]	Egypt	51	47	44.88 (5.64)	45.23 (6.72)	51/49 %	40.4/59.6 %	3 Months
Vellingiri et al.[21]	India	55	55	46.74 (12.45)	48.5 (10.39)	_	_	6 Months
Sherpy et al.[15]	Egypt	25	25	_	_	_	_	3 Months
Mahindra et al.[16]	India	25	25	30.72 (7.42)	33.92 (8.61)	68/32 %	52/48 %	3 Months
Monto[22]	USA	20	20	51 (21−69)	59 (24−74)	60/40 %	55/45 %	24 Months

PRP: Platelet-rich plasma.

treatments are linked to fewer patient-reported issues post-treatment. A summary of findings from the reviewed studies is presented in Table 2.

Quality assessment of included studies

The assessment of study quality, as it pertains to meta-analysis outcomes, encompassed several domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, completeness of outcome data, selective reporting, and other potential sources of bias. Methodological rigor for each study was appraised using the RoB-2 criteria.[14] Among the reviewed studies, six—Hafez et al.,[19] Sherpy et al.,[15] Mahindra et al.,[16] Uğurlar et al.,[17] Peerbooms et al.,[13] and Soraganvi et al.[18]—displayed elevated ratings in at least one domain, with noted concerns in certain categories (refer to Figure 2).

Analysis outcomes and heterogeneity

Meta-analysis was performed comparing PRP versus corticosteroid treatment in patients with chronic heel pain by using VAS and AOFAS scoring models for the measurement of pain and function outcomes, respectively.

PRP versus corticosteroids for foot pain relief (VAS)

Examining individual studies on PRP versus corticosteroids using VAS pain scores reveals conflicting results. Some studies, such as Ugurlar et al.,[20] found no significant difference between the two treatments (MD = 0.3),

Table 2: Summary of major outcomes of all included studies.

Study	Major findings
Soraganvi et al.[18]	• Both groups showed significant improvement in pain scores (VAS) and foot function (AOFAS) after the injection. The thickness of the affected tissue also decreased in both groups. Overall, the injections were effective in reducing pain and improving foot function.
Uğurlar et al.[17]	• The study looked at pain and function in the foot after different treatments. Overall, none of the treatments resulted in lasting improvement. Cortisone shots seemed to help more in the first 3 months, while shock wave therapy helped with pain for up to 6 months. However, the cortisone shot benefits went away over time.
Peerbooms et al.[13]	• The study found PRP injections to be more effective for foot pain than corticosteroid injections in the long term. While pain relief started quicker with corticosteroids, PRP injections led to greater pain reduction and decreased disability after a year. More people in the PRP group also experienced a significant improvement in their pain. The PRP group also had less disability
Hafez et al.[19]	• The study found that both CSIs and PRP injections were effective in reducing heel pain and improving quality of life compared to before the treatment. However, the benefit of CSIs seemed to lessen over time, whereas PRP injections showed continued improvement.
Vellingiri et al.[21]	• F020 The study looked at PRP vs. CSIs for knee osteoarthritis. PRP injections seemed to have better outcomes for patients. While there were some minor infections in both groups, the cortisone group had more side effects including skin issues and fat loss.
Sherpy et al.[15]	• The study looked at PRP vs. CSIs for knee osteoarthritis. PRP injections seemed to have better outcomes for patients. While there were some minor infections in both groups, the cortisone group had more side effects including skin issues and fat loss. Both injection methods were deemed safe, as none of the patients in either group experienced any significant complications.
Mahindra et al.[16]	• The study found that both PRP and CSIs led to significant improvements in pain scores and foot and ankle function. There was a greater improvement in the PRP group compared to the corticosteroid group at the final follow-up, although both groups showed improvement at 3 weeks and 3 months.
Monto[22]	• The study followed two groups for pain relief in the foot: cortisone and PRP. The cortisone group had initial improvement but the effects wore off over 2 years. The PRP group, however, showed significant improvement that lasted throughout the entire 2-year study.

PRP: Platelet-rich plasma; CSIs: Corticosteroid injections.

whereas others showed an advantage for either PRP (MD = −0.94 in Vellingiri et al.[21]) or corticosteroids (MD = 1.32 in Hafez et al.[19]). Other studies presented less conclusive results, such as those by Sherpy et al.[15] and Mahindra et al..[16] The meta-analysis of these findings provided valuable insights. A common-effect model indicated a significant advantage for PRP (MD = −0.7166), whereas the random-effects model demonstrated a non-significant difference (MD = 0.4657). This outcome emphasizes the critical role of the chosen analytical method in interpreting overall treatment effects. In addition, there was considerable variability among studies, with an I^2 statistic of 90.5 % and a significant Q-test for heterogeneity ($p < 0.0001$) (Figure 3). This high degree of heterogeneity suggests that factors beyond random chance, such as differences in study methodologies, patient populations, or treatment protocols, may have contributed to the variation in results.

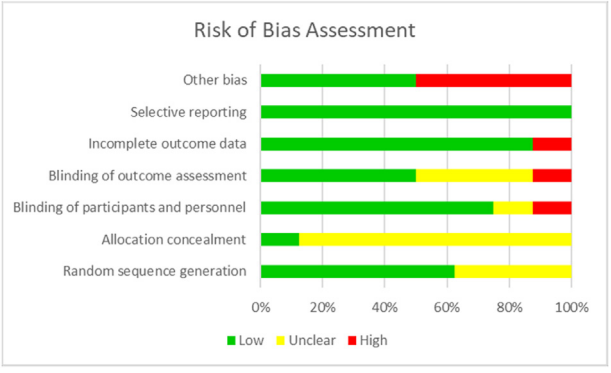

Figure 2: Risk of bias assessment.

PRP versus corticosteroids for foot activity recovery (AOFAS)

This meta-analysis compared the AOFAS scores between PRP and corticosteroid treatment for various conditions. Four studies were included. Three studies, namely Soraganvi

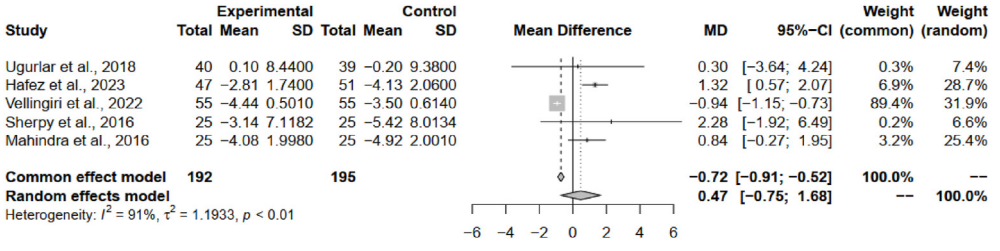

Figure 3: Meta-analysis of PRP versus corticosteroids to assess the pain relief using VAS score.

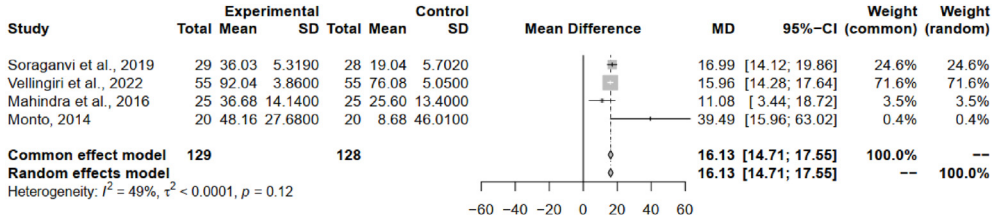

Figure 4: Meta-analysis of PRP versus corticosteroids to assess foot activity recovery using AOFAS.

et al.,[18] Vellingiri et al.,[21] and Monto[22], showed significant improvements in AOFAS scores favoring PRP treatment, with an MD ranging from 11.08 to 39.488. The fourth study by Mahindra et al.[16] also showed improvement with PRP but with a wider confidence interval (CI). When all of the data were combined, Both common-effect and random-effect models demonstrated a significant improvement in AOFAS scores with PRP treatment (MD = 16.1302, 95 % CI [14.7091, 17.5513]) (see Figure 4). Although moderate heterogeneity was observed among studies, it was not statistically significant, indicating that the variability may be attributable to chance. In summary, this meta-analysis suggests that PRP treatment is more effective than corticosteroids in enhancing AOFAS scores, reflecting superior improvement in foot function.

Publication bias (VAS)

The funnel plot asymmetry regression test assesses the relationship between effect size and standard error to detect potential publication bias within the meta-analytic framework. In this study, funnel plot asymmetry was examined using a mixed-effects meta-regression model, with standard error as a variable. The analysis yielded a p-value of 0.0830 and a z-score of 1.7334. Given that the p-value exceeds the conventional significance threshold of 0.05, there is minimal concern for publication bias in this meta-analysis, indicating no substantial evidence of asymmetry in the funnel plot (see Figure 5).

Under ideal conditions with no sampling variation, the estimated true effect size is −4.2036, with a 95 % CI spanning from −5.1369 to −3.2703, achieved as the standard error approaches zero. While these results do not strongly indicate significant publication bias, it is crucial to recognize that other potential biases or variations may still impact the overall findings of the meta-analysis. These limitations should be carefully considered in the interpretation of results.

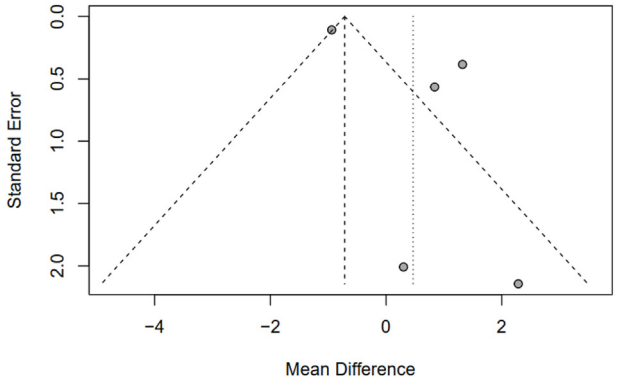

Figure 5: Funnel plot for the included studies (VAS).

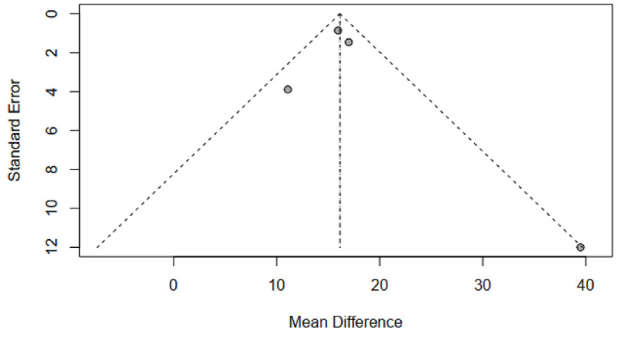

Figure 6: Funnel plot for included studies (AOFAS).

Publication bias (AOFAS)

This meta-analysis employed a regression test to assess funnel plot asymmetry as an indicator of publication bias. Applied to effect sizes reported in the studies, this test examines the relationship between effect size and reliability, as indicated by standard error. The test results were not statistically significant (z = −1.3087, p = 0.1906), suggesting that effect sizes are likely not skewed toward studies with particularly large or small effects. However, the lack of statistical significance (p > 0.05) means that publication bias cannot be entirely ruled out (see Figure 6). While these findings increase confidence in the conclusions of this meta-analysis, they do not fully exclude the possibility of bias.

Discussion

PF is a chronic degenerative disorder that originates from the PF, which is necessary for the normal biomechanics of the foot. It is usually presented as sharp, concentrated heel discomfort and pain[1]. Although PF is mostly treated conservatively by rest, massages, anti-inflammatory drugs, splints, orthotic devices, injections, and physiotherapy, pain may be still persistent.[3,4] Corticosteroids and PRP injections are considered effective treatment options for PF in terms of pain relief and functional improvement.[8,24]

In our study, we compared PRP with CSIs depending on their relative effectiveness in treating CPF. We also included more reliable assessment of these therapies by combining data to address the limitations of single studies and reduced the influence of outliers. A comprehensive search was done across electronic databases, including PubMed, Scopus, Web

of Science, Cochrane Library, and Google Scholar. The main findings of this study suggested that PRP, as reflected in improved AOFAS and VAS scores, is a preferred treatment option. This indicates that this comparison can support the hypothesis in which PRP is more beneficial in treating long-term PF in contrast to CSIs, which cannot be significantly useful for CPF.

Although the analysis revealed heterogeneity among studies, with some variability in methodologies and patient populations, the overall results underscore a trend favoring PRP. The analysis of funnel plot asymmetry and regression tests indicated no significant publication bias, adding credibility to the findings. While additional high-quality, large-scale studies are recommended to further validate these results, this meta-analysis suggests that PRP injections may offer a more effective, long-term solution for managing pain and improving quality of life in patients with CPF compared to CSIs.

Our analysis of VAS scores revealed varied outcomes among studies. Literature on treatment options of PF consider PRP more beneficial than CSI treatments,[9,25,26] while some indicated the opposite in which corticosteroids are more useful for PF.[19] Despite these findings, some studies have reported no significant difference between PRP and corticosteroid treatments.[17]

An analysis of post-treatment pain scores (VAS) indicated a statistically significant benefit of PRP over corticosteroids when using a common-effect model; however, this advantage was not observed in a random-effects model. This finding underscores the influence of the analytical approach on the interpretation of overall treatment efficacy. While the overall analysis suggested a trend, the substantial interstudy variation—evident from elevated I^2 statistics and significant Q-tests—indicated influences beyond random variation, potentially stemming from differences in study methodologies, patient characteristics, or treatment protocols. This indicates the need for more research and investigations to identify the factors contributing to these discrepancies.

In the management of PF, a number of studies have shown that PRP has superior health benefits than a steroid injection in the long term. The PRP group had significant improvement in foot function (based on AOFAS scores) and showed significantly less pain (based on VAS score) at the 6-month follow-up compared to the steroid group based on meta-analysis of 11 prospective trials involving 543 patients.[23] In addition, the mean change in the thickness of the PF was significantly higher in the PRP group than the sham group, indicating that the former seemed to have a more localized effect on the healing process.[9] Similar findings were made by Vellingiri et al.,[21] where they compared the effect of PRP injections with those of CSI, the study also showed that PRP injections made a reduction of PF thickness with more reduction on pain than CSIs. Such benefits were also evidenced by ultrasound scan. In comparing PRP and cortisone injections in the management of CPF, Hafez et al.[19] found that PRP was less painful and more effective than cortisone, which suggests that PRP leads to a better quality of life.

For long-term effectiveness, Uğurlar et al.[17] compared four treatments for CPF: extracorporeal shock wave therapy (ESWT), PRP injections, CSIs, and prolotherapy. Although corticosteroids provided the most rapid pain relief within 3 months, this effect diminished over time. ESWT offered relief for up to 6 months, whereas neither prolotherapy nor PRP showed significant advantages at 36 months, suggesting that all treatments converged in effectiveness over the long term. By contrast, Monto[22] directly compared PRP with cortisone injections for chronic, severe PF cases unresponsive to traditional nonoperative treatments. This study highlighted notable differences in long-term outcomes, whereas cortisone initially improved AOFAS scores from 52 to 81 at 3 months, after which the effect declined, nearing baseline levels by 24 months. Conversely, the PRP group demonstrated sustained improvement, with AOFAS scores increasing from 37 to 95 at 3 months and remaining consistently high over 24 months. These findings suggest that PRP may provide a more enduring solution for severe CPF management.

Limitations

This meta-analysis provides a comparison of PRP and CSIs for CPF by highlighting data from various studies despite their differences. It uses reliable statistical methods and shows PRP's advantage in improving foot function (AOFAS scores). However, these studies differ in methodologies, patient characteristics, and treatment protocols, which complicates the generalizability of results. In addition, variability in PRP preparation techniques, short follow-up durations, and small sample sizes may further limit the ability to assess long-term outcomes. Standardizing injection protocols and conducting studies with larger, more diverse populations and extended follow-ups would strengthen future investigations and studies.

Conclusions

Although CSIs are effective in delivering short-term pain relief, their benefits do not persist over time, limiting their overall impact on enhancing long-term patient quality of life. On the other hand, PRP injections exhibit superior effects regarding prolonged pain relief and functional improvement. This indicates that PRP may be more useful for patient's quality of life improvement in the case of CPF, particularly given the lower incidence of side effects and patient complaints following PRP treatment, as supported by enhanced AOFAS scores.

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Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

Not applicable as this study involves a review analysis of published articles.

Consent

Not applicable.

Author contributions

Concept: AMA, SNA; Literature Search: HAA, ZMA, ASA, AAM; Data Collection and Processing: HAA, ZMA, ASA, AAM; Analysis and Interpretation: HAA, ZMA, ASA, AAM.

Writing: AMA, SNA, HAA, ZMA; Critical Review: AMA, SNA, HAA, ZMA; Approval: SNA, AMA, HAA, ZMA, ASA, AAM.

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References

1. Buchanan Benjamin K, Kushner Donald, Fasciitis Plantar. *StatPearls Publishing*; 7 Jan 2024. PubMed, www.ncbi.nlm.nih.gov/books/NBK431073/.
2. Tseng Wen-Che, et al. Plantar fasciitis: an updated review. **Journal of Medical Ultrasound 6 Oct 2023**. https://doi.org/10.4103/jmu.jmu_2_23.
3. Rasenberg Nadine, et al. Incidence, prevalence, and management of plantar heel pain: a retrospective cohort study in Dutch primary care. **British Journal of General Practice 21 Oct. 2019**; 69(688): e801–e808. https://doi.org/10.3399/bjgp19x706061.
4. Møller Stefan, et al. Surgical or non-surgical treatment of plantar fasciopathy (SOFT): study protocol for a randomized controlled trial. **Trials 4 Oct 2022**; 23(1). https://doi.org/10.1186/s13063-022-06785-w.
5. Wheeler Patrick, et al. Surgery for patients with recalcitrant plantar fasciitis. **Orthopaedic Journal of Sports Medicine 1 Mar. 2014**; 2(3):232596711452790. https://doi.org/10.1177/2325967114527901.
6. Seth Ishith, et al. The role of corticosteroid injections in treating plantar fasciitis: a systematic review and meta-analysis. **The Foot Mar. 2023**; 54:101970. https://doi.org/10.1016/j.foot.2023.101970.
7. Pardo-Camps Francesc, Pardo-Bosch Francesc. New infiltration technique in the treatment of the plantar fascia syndrome based on platelet-rich plasma. **Journal of Clinical Medicine 28 Dec 2023**; 13(1): 170. https://doi.org/10.3390/jcm13010170. 170, . [Accessed 31 August 2024].
8. Kalia RB, et al. Role of platelet rich plasma in chronic plantar fasciitis: a prospective study. **Indian Journal of Orthopaedics 6 Oct 2020**; 55: 142–148. https://doi.org/10.1007/s43465-020-00261-w.
9. Sharma Rachit, et al. Effect of platelet-rich plasma versus steroid injection in plantar fasciitis: a randomized clinical trial. **BMC Musculoskeletal Disorders 7 Mar 2023**; 24(1). https://doi.org/10.1186/s12891-023-06277-1.
10. Jain Kowshik, et al. Platelet rich plasma versus corticosteroid injection for plantar fasciitis: a comparative study. **The Foot Dec 2015**; 25(4): 235–237. https://doi.org/10.1016/j.foot.2015.08.006. . [Accessed 12 October 2020].
11. Cochrane. *Cochrane handbook for systematic reviews of interventions. Cochrane.org*; 2023. training.cochrane.org/handbook.
12. Page Matthew J, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. **British Medical Journal 29 Mar 2021**; 372(71). https://doi.org/10.1136/bmj.n71.
13. Peerbooms Joost C, et al. Positive effect of platelet-rich plasma on pain in plantar fasciitis: a double-blind multicenter randomized controlled trial. **The American Journal of Sports Medicine 11 Oct 2019**; 47(13): 3238–3246. https://doi.org/10.1177/0363546519877181.
14. Sterne Jonathan AC, et al. RoB 2: a revised tool for assessing Risk of bias in randomised trials. **BMJ 28 Aug 2019**; 366(1): l4898. https://doi.org/10.1136/bmj.l4898. www.bmj.com/content/366/bmj.l4898.
15. Sherpy Nagwa A, et al. Local injection of autologous platelet rich plasma compared to corticosteroid treatment of chronic plantar fasciitis patients: a clinical and ultrasonographic follow-up study. **The Egyptian Rheumatologist July 2016**; 38(3): 247–252. https://doi.org/10.1016/j.ejr.2015.09.008. . [Accessed 4 April 2021].
16. Mahindra Pankaj, et al. Chronic plantar fasciitis: effect of platelet-rich plasma, corticosteroid, and placebo. **Orthopedics Mar 2016**; 39(2). https://doi.org/10.3928/01477447-20160222-01.
17. Uğurlar Meriç, et al. Effectiveness of four different treatment modalities in the treatment of chronic plantar fasciitis during a 36-month follow-up period: a randomized controlled trial. **The Journal of Foot and Ankle Surgery Sept 2018**; 57(5): 913–918. https://doi.org/10.1053/j.jfas.2018.03.017.
18. Soraganvi P, et al. Is platelet-rich plasma injection more effective than steroid injection in the treatment of chronic plantar fasciitis in achieving long-term relief? **Malaysian Orthopaedic Journal 1 Nov 2019**; 13(3): 8–14. https://doi.org/10.5704/moj.1911.002.
19. Hafez AE, et al. Musculoskeletal ultrasound changes in chronic plantar fascia after treatment with platelet rich plasma compared to steroid. **Muscle Ligaments and Tendons Journal Mar 2023**; 13(1): 126. https://doi.org/10.32098/mltj.01.2023.14. [Accessed 9 May 2023].
20. Toomey E Pepper. Plantar heel pain. **Foot and Ankle Clinics June 2009**; 14(2): 229–245. https://doi.org/10.1016/j.fcl.2009.02.001.
21. Vellingiri Kishore, et al. A prospective study comparing the efficacy of local injection of platelet-rich plasma (PRP) vs methylprednisolone in plantar fasciitis. **Cureus 31 May 2022**. https://doi.org/10.7759/cureus.25523.
22. Monto Raymond Rocco. Platelet-rich plasma efficacy versus corticosteroid injection treatment for chronic severe plantar fasciitis. **Foot & Ankle International 13 Jan 2014**; 35(4): 313–318. https://doi.org/10.1177/1071100713519778.
23. Mohammed Wafi, et al. Therapeutic efficacy of platelet-rich plasma injection compared to corticosteroid injection in plantar fasciitis: a systematic review and meta-analysis. **Journal of Orthopaedics Nov 2020**; 22: 124–134. https://doi.org/10.1016/j.jor.2020.03.053.
24. Whittaker Glen A, et al. Corticosteroid injection for plantar heel pain: a systematic review and meta-analysis. **BMC Musculoskeletal Disorders 17 Aug 2019**; 20(1). https://doi.org/10.1186/s12891-019-2749-z.

25. Kumar Krishan, et al. Comparison of platelet-rich plasma and corticosteroid injections for chronic plantar fasciitis: a randomized controlled trial. **Cureus 4 May 2024**. https://doi.org/10.7759/cureus.59656. pubmed.ncbi.nlm.nih.gov/38836136/, . [Accessed 8 October 2024].
26. Shetty Vijay D, et al. A study to compare the efficacy of corticosteroid therapy with platelet-rich plasma therapy in recalcitrant plantar fasciitis: a preliminary report. **Foot and Ankle Surgery Mar 2014**; 20(1): 10–13. https://doi.org/10.1016/j.fas.2013.08.002. . [Accessed 10 April 2021].

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