**Clinical Question: As in the past, please briefly outline the scenario and state your clinical question as concisely and specifically as possible**

Scenario: Pt w/ history of Plantar fasciitis c/o heel pain worsen in the morning, and relieve throughout the day. Already taking NSAIDs but only with mild to no relief. Considering steroid treatment. Wants to know if other available treatment options are available.

**Question:** For patients with plantar fasciitis, is platelet-rich plasma (PRP) therapy effective in pain relief when compared to steroid treatment?

**PICO Question:**

**Identify the PICO elements – this should be a revision of whichever PICO you have already begun in a previous week**

|  |  |  |  |
| --- | --- | --- | --- |
| Plantar fasciitis | Platelet-rich plasma | Steroid | Pain relief |
| adults |  | Conservative treatment | Pain scale |
|  |  |  | Quality of Life |
|  |  |  | Safety and efficacy |
|  |  |  | Improvement in functional restoration |

**Search Strategy:**

**Outline the terms used, databases or other tools used, how many articles returned, and how you selected the final articles to base your CAT on. This will likewise be a revision and refinement of what you have already done.**

Key words used: “plantar fasciitis”, “Platelet-rich plasma”, “steroid”, “pain”, “pain relief”, “functional improvement”

Pubmed:

* Platelet-rich plasma/plantar fasciitis/most recent: 65 results
* Platelet-rich plasma/plantar fasciitis/best match: 69 results
* Platelet-rich plasma/plantar fasciitis/best match/10 years: 68 results
* Platelet-rich plasma/plantar fasciitis/best match/10 years/humans/English/adult: 24 results

CINAHL:

* Platelet-rich plasma/plantar fasciitis/10 years: 65 results
* Platelet-rich plasma/plantar fasciitis/10 years/adults: 15 results

Cochrane Library:

* Platelet-rich plasma/plantar fasciitis/10 years: 8 results

**How do I narrow down my articles?**

* Articles are narrowed down by having the key words in the title and abstract. Then articles of the most recent and higher level of evidence will be selected. The population of study, intervention and control, outcome of the study will also need to match my PICO question.

**Articles Chosen (3-5) for Inclusion (please copy and paste the abstract with link):**

[**Platelet-rich plasma as a treatment for plantar fasciitis: A meta-analysis of randomized controlled trials.**](https://www.ncbi.nlm.nih.gov/pubmed/29095303)

**Yang WY, Han YH, Cao XW, Pan JK, Zeng LF, Lin JT, Liu J.**

**2017 Nov;96(44):e8475. doi: 10.1097/MD.0000000000008475. Review.**

**PMID: 29095303**

**BACKGROUND: Recently, platelet-rich plasma (PRP) has been used as an alternative therapy for plantar fasciitis (PF) to reduce heel pain and improve functional restoration. We evaluated the current evidence concerning the efficacy and safety of PRP as a treatment for PF compared with the efficacy and safety of steroid treatments.**

**METHODS: Databases (PubMed, EMBASE, and The Cochrane Library) were searched from their establishment to January 30, 2017, for randomized controlled trials (RCTs) comparing PRP with steroid injections as treatments for PF. The Cochrane risk of bias (ROB) tool was used to assess the methodological quality. Outcome measurements were the visual analogue scale (VAS), Foot and Ankle Disability Index (FADI), American Orthopedic Foot and Ankle Society (AOFAS) scale, and the Roles and Maudsley score (RMS). The statistical analysis was performed with RevMan 5.3.5 software.**

**RESULTS: Nine RCTs (n = 430) were included in this meta-analysis. Significant differences in the VAS were not observed between the 2 groups after 4 [weighted mean difference (WMD) = 0.56, 95% confidence interval (95% CI): -1.10 to 2.23, P = .51, I = 89%] or 12 weeks of treatment (WMD = -0.49, 95% CI: -1.42 to 0.44, P = .30, I = 89%). However, PRP exhibited better efficacy than the steroid treatment after 24 weeks (WMD = -0.95, 95% CI: -1.80 to -0.11, P = .03, I = 85%). Moreover, no significant differences in the FADI, AOFAS, and RMS were observed between the 2 therapies (P > .05).**

**CONCLUSION: Limited evidence supports the conclusion that PRP is superior to steroid treatments for long-term pain relief; however, significant differences were not observed between short and intermediate effects. Because of the small sample size and the limited number of high-quality RCTs, additional high-quality RCTs with larger sample sizes are required to validate this result.**

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[**Effects of platelet-rich plasma in the treatment of plantar fasciitis: A meta-analysis of randomized controlled trials.**](https://www.ncbi.nlm.nih.gov/pubmed/30212938)

**Ling Y, Wang S.**

**Medicine (Baltimore). 2018 Sep;97(37):e12110. doi: 10.1097/MD.0000000000012110.**

**PMID: 30212938**

**Abstract**

**BACKGROUND: Plantar fasciitis is a common cause of heel pain, which often results in significant morbidity. There have been several treatment options that are used for plantar fasciitis, including nonsteroidal anti-inflammatory drugs, orthoses, physical therapy, and steroid injections.**

**OBJECTIVES: The aim of this meta-analysis was to compare the effects of platelet-rich plasma (PRP) and other treatments in patients with plantar fasciitis.**

**SEARCH METHODS: Medline, Web of Science, and Embase were systematically searched to identify relevant trials.**

**SELECTION CRITERIA: Randomized controlled trials (RCTs) that compared the effects of PRP and other treatments on plantar fasciitis were included.**

**DATA COLLECTION AND ANALYSIS: The main outcomes included changes from baseline in visual analog scale (VAS) score, American Orthopaedic Foot and Ankle Society Score (AOFAS), and Roles-Maudsley score (RMS). Results were expressed as weight mean difference (WMD) with 95% confidence interval (95% CI). The meta-analysis was performed using a fixed-effects or random-effects model according to heterogeneity.**

**MAIN RESULTS: Ten RCTs involving a total of 445 patients with plantar fasciitis were included. Among these studies, 9 compared PRP with steroid, and 1 compared PRP with whole blood. Four studies were categorized as being at low risk of bias, and the remaining 6 as being at unclear risk of bias. Pooled estimates suggested that PRP had greater changes in VAS and AOFAS scores than other treatments. However, it had no benefit effect in the RMS. Subgroup analysis for VAS and AOFAS showed that PRP had superior effect than other treatments at 12 months, but not at the 1, 3, 6 months. Subgroup analysis based on treatment regimens demonstrated that PRP was more effective than steroid in the change from baseline in AOFAS, but not in VAS and RMS scores.**

**AUTHORS' CONCLUSION: PRP was as effective as other treatments in reducing pain and improving function in patients with plantar fasciitis. Subgroup analysis indicated that PRP had better effect than steroid in AOFAS Score and its effect was durable in a long term. However, considering the potential limitations in this study, more large-scale RCTs are needed to confirm the current findings.**

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[**Efficacy of platelet-rich plasma as conservative treatment in orthopedics: a systematic review and meta-analysis.**](https://www.ncbi.nlm.nih.gov/pubmed/30201082)

**Franchini M, Cruciani M, Mengoli C, Marano G, Pupella S, Veropalumbo E, Masiello F, Pati I, Vaglio S, Liumbruno GM.**

**Blood Transfus. 2018 Nov;16(6):502-513. doi: 10.2450/2018.0111-18. Epub 2018 Sep 3. Review.**

**PMID: 30201082**

**Abstract:BACKGROUND: The aim of this systematic review and meta-analysis was to evaluate the benefit of platelet-rich plasma (PRP) in non-surgical orthopedic procedures.**

#### **MATERIAL AND METHODS: We searched the Cochrane Wounds Specialized Register, CENTRAL, MEDLINE (through PUBMED), Embase, and SCOPUS. We also searched clinical trials registries for ongoing and unpublished studies and checked reference lists to identify additional studies.**

#### **RESULTS: We found 36 randomized controlled trials (2,073 patients) that met our inclusion criteria. The included studies mostly had small numbers of participants (from 20 to 225). Twenty-eight studies included patients with lateral epicondylitis or plantar fasciitis. PRP was compared to local steroids injection (19 studies), saline injection (6 studies), autologous whole blood (4 studies), local anesthetic injection (3 studies), dry needling injection (3 studies), and to other comparators (4 studies). Primary outcomes were pain and function scores, and adverse events. On average, it is unclear whether or not use of PRP compared to controls reduces pain scores and functional score at short- (up to 3 months) and medium- (4-6 months) term follow-up. The available evidence for all the comparisons was rated as very low-quality due to inconsistency, imprecision, and risk of bias in most of the selected studies. There were no serious adverse events related to PRP injection or control treatments.**

#### **CONCLUSIONS: The results of this meta-analysis, which documents the very marginal effectiveness of PRP compared to controls, does not support the use of PRP as conservative treatment in orthopedics.**

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[**Effectiveness and relevant factors of platelet-rich plasma treatment in managing plantar fasciitis: A systematic review.**](https://www.ncbi.nlm.nih.gov/pubmed/27904584)

**Chiew SK, Ramasamy TS, Amini F.**

**J Res Med Sci. 2016 Jun 14;21:38. eCollection 2016. Review.**

**PMID: 27904584**

#### **BACKGROUND: Plantar fasciitis (PF) is a common foot complaint, affects both active sportsmen and physically inactive middle age group. It is believed that PF results from degenerative changes rather than inflammation. Platelet-rich plasma (PRP) therapy has been introduced as an alternative therapy for PF. This study is aimed to systematically review to the effectiveness and relevant factors of PRP treatment in managing PF.**

#### **MATERIALS AND METHODS: A search was conducted in electronic databases, including PubMed, Scopus, and Google Scholar using different keywords. Publications in English-language from 2010 to 2015 were included. Two reviewers extracted data from selected articles after the quality assessment was done.**

#### **RESULTS: A total of 1126 articles were retrieved, but only 12 articles met inclusion and exclusion criteria. With a total of 455 patients, a number of potentially influencing factors on the effectiveness of PRP for PF was identified. In all these studies, PRP had been injected directly into the plantar fascia, with or without ultrasound guidance. Steps from preparation to injection were found equally crucial. Amount of collected blood, types of blood anti-coagulant, methods in preparing PRP, speed, and numbers of time the blood samples were centrifuged, activating agent added to the PRP and techniques of injection, were varied between different studies. Regardless of these variations, superiority of PRP treatment compared to steroid was reported in all studies.**

#### **CONCLUSION: In conclusion, PRP therapy might provide an effective alternative to conservative management of PF with no obvious side effect or complication. The onset of action after PRP injection also greatly depended on the degree of degeneration.**

**Summary of the Evidence**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Author (Date) | Level of Evidence | Sample/Setting  (# of subjects/ studies, cohort definition etc. ) | Outcome(s) studied | Key Findings | Limitations and Biases |
| **Article #1**  Yang WY, Han YH, Cao XW, Pan JK, Zeng LF, Lin JT, Liu J.  2017 Nov | Meta-analysis of RCTs | 9 RCTs with 430 participants | Pain relief, visual analogue scale (VAS), Foot and Ankle Disability Index (FADI), American Orthopedic Foot and Ankle Society scale (AOFAS), and Roles and Maudsley score (RMS) | -VAS: no significant differences were observed between the 2 groups. (WMD) = 0.56, 95% confidence interval (95% CI): -1.10 to 2.23, P = .51, I = 89%] or 12 weeks of treatment (WMD = -0.49, 95% CI: -1.42 to 0.44, P = .30, I = 89%). However, platelet-rich plasma exhibited better efficacy than the steroid treatment after 24 weeks (WMD = -0.95, 95% CI: -1.80 to -0.11, P = .03, I = 85%).  -FADI: no significant differences between the 2 groups after 12 weeks. (WMD=14.08, 95% CI: -11.57 to 39.73, P=0.28, I^2 = 99%)  -AOFAS scale: no significant differences between the 2 groups after 12 weeks. (WMD=0.94, 95% CI: -5.99 to 7.86, p=0.79, I^2=81%)  -RMS: no significant differences between the 2 groups after 6 months. (RR=1.75, 95%CI: 0.27-11.38, P=0.56, I^2=90%)  -No significant difference in pain relief between platelet rich plasma for short term or intermediate term. However, platelet rich plasma displays better long-term efficacy. Platelet rich plasma and steroids have similar effects on functional improvement. | -Only 9 studies were included in the study with 430 participants. The credibility for all outcome may be limited by the small sample size.  -Some of the reported results are subjective, such as VAS score.  -Longest assessment period in the included studies was 48 weeks after PRP administration, unable to determine whether the issue reoccurrence 1 year after PRP treatment. |
| **Article #2**  Ling Y, Wang.S  2018 Sep | Meta-analysis of RCTs | 10 RCTs with 445 patients | VAS, AOFAS, RMS | -Platelet rich plasma had a greater decrease in VAS score than placebo (WMD = -4.01, 95% CI: -5.54, -2.49; P < .001), but a comparable change with steroid (WMD = -0.47, 95% CI: -0.94, 0.01; PP=.247).  - Platelet rich plasma had a significant increase in AOFAS score when compared with steroid (WMD=7.85, 95% CI: 0.48, 15.23; P = .037) or placebo (WMD = 32.7, 95% CI: 25.5, 39.89; P < .001).  -Platelet rich plasma did not have an advantage effect in the decrease of RMS when compared with steroid (WMD=\_0.09, 95% CI: \_0.84, 0.65; P = .809)  -PRP was effective at reducing pain and improving physical function  -Long term PRP could improve pain and physical function, but 1 to 6 months of short term PRP could not.  -PRP should be used as an alternative approach for patients with plantar fasciitis | - study was conducted based on 10 RCTs, all of which had a relatively small sample size (N<100). This might be more likely to result in an overestimation of the treatment effects compared to larger trials.  - Data analysis for RMS was based on 3 RCTs, conclusion about the effects of PRP in RMS should be interpreted with caution. |
| **Article #3**  Franchini M, Cruciani M, Mengoli C, Marano G, Pupella S, Veropalumbo E, Masiello F, Pati I, Vaglio S, Liumbruno GM.  2018 Nov | Systematic review and meta-analysis. | 36 RCTs with 2,073 patients | VAS, functional measurement such as AOFAS, plantar fascia thickness measured by ultrasound.  Study also include VAS at 3 months (8 studies, 420 patients) and 6 months (6 studies, 300 patients) | -With steroids as control, data shows slightly better pain scores in PRP treated group at 6 months (260 patients; MD -9.47; 95% CI: -17.98/0.97; I^2=92%), but not at 3 months (8 studies, 420 patients; MD -8.95)  -Both at 3 months (178 patients) and at 6 months (218 patients), AOFAS did not change significantly between the PRP and steroid group (MD, 4.26; 95%CI： -5.96/12.47; and 4.25; 95%CI: -5.92/14.42, respectively)  -Plantar fascia thickness measured by ultrasounds: no significant difference between groups  - PRP injection may not result in lower pain and function scores  -Marginal benefit at medium term follow up (4-6 months) for VAS outcome was observed | -Were not able to determine the long-term (>12 months) effect of RPR  -Lack of standardization of PRP production among different studies and limits the validity of an inter-studies comparison.  - Studies mostly had small numbers of participants (from 20 to 225) |
| **Article #4**  Chiew SK, Ramasamy TS, Amini F  2016 Jun | Systemic Review  (prospective cohort, RCTs, retrospective cohort) | 12 articles with 445 patients | AOFAS, RMS, VAS, postinjection foot and ankle outcome scores, foot function index, and 12-item short form health survey (SF-12) | -In most of the studies, the improvement was observed during the first 3 months after injection. Significant improvement was also noted when the patient was followed up till 12 months postinjection.  -Single injections of PRP decreased pain and improves function better than a corticosteroid injection.  -No evidence of side effect or complications when PRP was used in treating PF. | -Sample size of the 12 studies ranged from 14 to 60 participants.  - absence of placebo for comparison |

**Conclusion(s)** Briefly summarize the conclusions of each article, then provide an overarching conclusion.

**Article #1:** No significant difference in pain relief between platelet rich plasma for short term or intermediate term. However, platelet rich plasma displays better long-term efficacy. Platelet rich plasma and steroids have similar effects on functional improvement.

**Article #2:** PRP was effective at reducing pain and improving physical function. Long term PRP could improve pain and physical function, but 1 to 6 months of short term PRP could not. PRP should be used as an alternative approach for patients with plantar fasciitis

**Article #3:** Plantar fascia thickness measured by ultrasounds: no significant difference between groups. PRP injection may not result in lower pain and function scores. Marginal benefit at medium term follow up (4-6 months) for VAS outcome was observed

**Article #4:** Improvement was observed during the first 3 months after injection. Significant improvement was also noted when the patient was followed up till 12 months post-injection. No evidence of side effect or complications when PRP was used in treating PF.

**Overall conclusion: PRP is effective at reducing pain and improving physical function, with more significant improvement for long term compared to short term. No evidence of side effect or complication when PRP was used in treating PF. PRP has similar effects on functional improvement compared to steroid.**

**Clinical Bottom Line:**

Local injection of PRP is an emerging therapeutic alternative. Therefore, number of RCTs have been done to evaluate whether the use of PRP is effective for pain relief and functional improvements for patients with plantar fasciitis. However, the effectiveness of PRP injection still remains controversial. I have found 4 articles, which all are meta-analysis/systematic reviews. These are also published very recently. However, the RCTs included in the studies are mostly small scale and not high qualitied. Benefit of PRP in the studies has shown to be effective in long term uses, but not in short term uses for plantar fasciitis. It is also shown that PRP has similar effects on functional improvement compared to steroid injection. Local injection of PRP should not be fully replaced steroid injection for the treatment of chronic plantar fasciitis. More well-designed RCT studies with larger samples and higher quality will be needed to prove the effects of PRP with steroid treatment.