

Safety and Efficacy of Intra-articular Injection of Platelet-Rich Plasma in Patients With Ankle Osteoarthritis.

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Author information

Abstract

BACKGROUND:

An intra-articular injection of platelet-rich plasma (PRP) may be an effective treatment for osteoarthritis (OA). However, its efficacy in ankle OA has not been investigated yet. The purpose of this study was to assess the safety and efficacy of an intra-articular injection of PRP in patients with ankle OA during a 24-week period.

METHODS:

Twenty ankles of 20 patients with varus-type ankle OA who received intra-articular injections of PRP were evaluated. PRP was extracted from whole blood by using the double-spin technique. Three injections of 2-mL PRP were administered to the ankle at an interval of 2 weeks under ultrasonographic guidance. Adverse events and efficacy were assessed at 4, 12, and 24 weeks after the last injection. Clinical outcomes were assessed by using the visual analog scale (VAS) for pain, the Japanese Society for Surgery of the Foot (JSSF) ankle/hindfoot scale, and the Self-Administered Foot Evaluation Questionnaire (SAFE-Q).

RESULTS:

No serious adverse effects were observed during the follow-up period. The VAS and JSSF scale scores significantly decreased from baseline to 4, 12, and 24 weeks after treatment ($P < .001$). The mean score in the pain-related subscale of the SAFE-Q significantly improved from baseline to 12 weeks after treatment ($P = .04$). Overall, the amount of pain reduction was maximal at 12 weeks after the last injection, and the effect was reduced at 24 weeks. The patients with late-stage OA had worse scores in all outcomes than those with early-stage OA.

CONCLUSION:

Intra-articular injections of PRP resulted in no serious adverse effects and significantly reduced pain in the patients with ankle OA. PRP treatment can be safe and effective and may be an option in the treatment of ankle OA.

LEVEL OF EVIDENCE:

Level IV, case series.

KEYWORDS:

ankle osteoarthritis; conservative treatment; platelet-rich plasma (PRP); ultrasonographic guidance injection

Platelet rich plasma (PRP) induces chondroprotection via increasing autophagy, anti-inflammatory markers, and decreasing apoptosis in human osteoarthritic cartilage.

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Abstract

OBJECTIVES:

Autophagy constitutes a defense mechanism to overcome aging and apoptosis in osteoarthritic cartilage. Several cytokines and transcription factors are linked to autophagy and play an important role in the degradative cascade in osteoarthritis (OA). Cell therapy such as platelet rich plasma (PRP) has recently emerged as a promising therapeutic tool for many diseases including OA. However, its mechanism of action on improving cartilage repair remains to be determined. The purpose of this study is to investigate the effect of PRP on osteoarthritic chondrocytes and to elucidate the mechanism by which PRP contributes to cartilage regeneration.

METHODS:

Osteoarthritic chondrocytes were co-cultured with an increasing concentration of PRP obtained from healthy donors. The effect of PRP on the proliferation of chondrocytes was performed using cell counting and WST8 proliferation assays. Autophagy, apoptosis and intracellular level of IL-4, IL-10, and IL-13 were determined using flow cytometry analyses. Autophagy markers BECLIN and LC3II were also determined using quantitative polymerase chain reaction (qPCR). qPCR and ELISA were used to measure the expression of ADAMTS-5, MMP3, MMP13, TIMP-1-2-3, aggrecan, Collagen type 2, TGF- β , Cox-2, IL-6, FOXO1, FOXO3, and HIF-1 in tissues and co-cultured media.

RESULTS:

PRP increased significantly the proliferation of chondrocytes, decreased apoptosis and increased autophagy and its markers along with its regulators FOXO1, FOXO3 and HIF-1 in osteoarthritic chondrocytes. Furthermore, PRP caused a dose-dependent significant decrease in MMP3, MMP13, and ADAMTS-5, IL-6 and COX-2 while increasing TGF- β , aggrecan, and collagen type 2, TIMPs and intracellular IL-4, IL-10, IL-13.

CONCLUSION:

These results suggest that PRP could be a potential therapeutic tool for the treatment of OA.

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KEYWORDS:

Anti-inflammatory cytokines; Apoptosis; Autophagy; Osteoarthritis; Platelet rich plasma

The temporal effect of platelet-rich plasma on pain and physical function in the treatment of knee osteoarthritis: systematic review and meta-analysis of randomized controlled trials.

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Abstract

BACKGROUND:

Quite a few randomized controlled trials (RCTs) investigating the efficacy of platelet-rich plasma (PRP) for treatment of knee osteoarthritis (OA) have been recently published. Therefore, an updated systematic review was performed to evaluate the temporal effect of PRP on knee pain and physical function.

METHODS:

Pubmed, Embase, Cochrane library, and Scopus were searched for human RCTs comparing the efficacy and/or safety of PRP infiltration with other intra-articular injections. A descriptive summary and quality assessment were performed for all the studies finally included for analysis. For studies reporting outcomes concerning Western Ontario and McMaster Universities Arthritis Index (WOMAC) or adverse events, a random-effects model was used for data synthesis.

RESULTS:

Fourteen RCTs comprising 1423 participants were included. The control included saline placebo, HA, ozone, and corticosteroids. The follow-up ranged from 12 weeks to 12 months. Risk of bias assessment showed that 4 studies were considered as moderate risk of bias and 10 as high risk of bias. Compared with control, PRP injections significantly reduced WOMAC pain subscores at 3, 6, and 12 months follow-up ($p = 0.02$, 0.004 , <0.001 , respectively); PRP significantly improved WOMAC physical function subscores at 3, 6, and 12 months ($p = 0.002$, 0.01 , <0.001 , respectively); PRP also significantly improved total WOMAC scores at 3, 6 and 12 months (all $p < 0.001$); nonetheless, PRP did not significantly increase the risk of post-injection adverse events (RR, 1.40 [95% CI, 0.80 to 2.45], $I^2 = 59\%$, $p = 0.24$).

CONCLUSIONS:

Intra-articular PRP injections probably are more efficacious in the treatment of knee OA in terms of pain relief and self-reported function improvement at 3, 6 and 12 months follow-up, compared with other injections, including saline placebo, HA, ozone, and corticosteroids.

REVIEW REGISTRATION:

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KEYWORDS:

Hyaluronic acid; Knee; Osteoarthritis; Platelet-rich plasma; Systematic review

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Leukocyte-Reduced Platelet-Rich Plasma Treatment of Basal Thumb Arthritis: A Pilot Study.

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Abstract

A positive effect of intra-articular platelet-rich plasma (PRP) injection has been discussed for osteoarthritic joint conditions in the last years. The purpose of this study was to evaluate PRP injection into the trapeziometacarpal (TMC) joint. We report about ten patients with TMC joint osteoarthritis (OA) that were treated with 2 intra-articular PRP injections 4 weeks apart. PRP was produced using the Double Syringe System (Arthrex Inc., Naples, Florida, USA). A total volume of 1.47 ± 0.25 mL PRP was injected at the first injection and 1.5 ± 0.41 mL at the second injection, depending on the volume capacity of the joint. Patients were evaluated using VAS, strength measures, and the Mayo Wrist score and DASH score after 3 and 6 months. VAS significantly decreased from 6.2 ± 1.6 to 5.4 ± 2.2 at six-month follow-up ($P < 0.05$). The DASH score was unaffected; however, the Mayo Wrist score significantly improved from 46.5 ± 18.6 to 67.5 ± 19.0 at six-month follow-up ($P = 0.05$). Grip was unaffected, whereas pinch declined from 6.02 ± 2.99 to 3.96 ± 1.77 at six-month follow-up ($P < 0.05$). We did not observe adverse events after the injection of PRP, except one occurrence of a palmar wrist ganglion, which resolved without treatment. PRP injection for symptomatic TMC OA is a reasonable therapeutic option in early stages TMC OA and can be performed with little to no morbidity.

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