INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Effectiveness of platelet-rich plasma for patients with carpal tunnel syndrome: a systematic review and meta-analysis of current evidence in randomized controlled trials

Jiang, JB[1]; Xing, F[2]; Luo, R[3]; Liu, M[4].

Review question / Objective: **Recently, there was a series of clinical studies focusing on local injection of platelet-rich plasma (PRP) for treatment of patients with carpal tunnel syndrome (CTS). However, the safety and efficacy of PRP in these CTS patients remains controversial. Therefore, we performed a systematic review to compare PRP with other conservative treatment in treatment of CTS patients.**
Information sources: **Electronic databases, including Cochrane, PubMed, Web of Science, and EMBASE. After the electronic search is completed, manual searches were carried out on related literatures and references to find potential eligible studies.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 February 2022 and was last updated on 26 February 2022 (registration number INPLASY202220116).

INTRODUCTION

Review question / Objective: **Recently, there was a series of clinical studies focusing on local injection of platelet-rich plasma (PRP) for treatment of patients with carpal tunnel syndrome (CTS). However, the safety and efficacy of PRP in these CTS patients remains controversial. Therefore, we performed a systematic review to**

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compare PRP with other conservative treatment in treatment of CTS patients.

Condition being studied: Currently, various conservative treatment, including wrist splinting, local steroid injections, oral medications, and acupuncture are used for mild to moderate carpal tunnel syndrome (CTS). However, the results of these conservative treatments are not satisfactory to patients. Platelet-rich plasma (PRP) is a concentrated product of autologous blood, containing concentrated platelets and various growth factors. PRP not only has a good ability of anti-inflammatory and tissue repair, but also can promote the regeneration of peripheral neurons. PRP has been widely used in refractory wounds, external humeral epicondylitis, and plantar fasciitis. Recently, the application of local PRP injection has gradually applied in the treatment of CTS. Compared with other conservative managements, the clinical effect of local injection of PRP in the treatment of CTS patients is still controversial. Therefore, we performed this systematic review and meta-analysis to evaluate the efficacy and safety of local PRP injection in treatment for CTS.

METHODS

Participant or population: Patients were adults and diagnosed with carpal tunnel syndrome.

Intervention: Patients were treated with local platelet-rich plasma injection.

Comparator: Patients who were treated with other conservative management, such as wrist splint and local injection with methylprednisolone acetate, triamcinolone, hyaluronidase, dextrose and normal saline.

Study designs to be included: The studies were original, randomized control trials (RCTs) only.

Eligibility criteria: The eligibility inclusion criteria for this study were as follows: (1) Population: patients were adults and diagnosed with CTS. (2) Intervention: patients were treated with local PRP injection. (3) Comparator: patients who were treated with other conservative management, such as wrist splint and local injection with methylprednisolone acetate, triamcinolone, hyaluronidase, dextrose and normal saline. (4) Outcomes: one of the following results was reported, the visual analogue scale (VAS), Boston carpal tunnel questionnaire (BCTQ) including subscales of symptom severity scale (SSS) and functional status scale (FSS), cross-sectional area (CSA) of MN and electrodiagnostic examination parameters including distal motor latency (DML), sensory nerve conduction velocity (SNCV), sensory peak latency (SPL). (5) Study design: The studies were original, randomized control trials (RCTs) only. (6) The studies report PRP's preparations and injection procedures performed in CTS patients.

Information sources: Electronic databases, including Cochrane, PubMed, Web of Science, and EMBASE. After the electronic search is completed, manual searches were carried out on related literatures and references to find potential eligible studies.

Main outcome(s): Outcomes: one of the following results was reported, the visual analogue scale (VAS), Boston carpal tunnel questionnaire (BCTQ) including subscales of symptom severity scale (SSS) and functional status scale (FSS), cross-sectional area (CSA) of median nerve and electrodiagnostic examination parameters including distal motor latency (DML), sensory nerve conduction velocity (SNCV), sensory peak latency(SPL).

Quality assessment / Risk of bias analysis: The methodological quality of trials included in this study were evaluated independently by two reviewers, according to Cochrane Collaboration for Systematic Reviews. The following items were considered: random sequence generation, allocation sequence concealment, blinding of participants and personnel, blinding of outcomes assessment, incomplete outcome data, selective reporting, and other bias.

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Strategy of data synthesis: The statistical analysis was independently performed with RevMan software (Version 5.4; Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2020) by two reviewers. The mean difference (MD) between groups of PRP and control were reported with 95% confidence interval (95% CI) and performed to evaluate continuous variables. To measure heterogeneity between studies, we used the I^2 statistic. Furthermore, heterogeneity was accepted, and the randomized-effects model was performed, when I2 was>50%. Otherwise, the fixed-effects model was performed. Forest plots were used to graphically represent the difference in outcomes of groups of PRP and control and for all included studies. If P values were <0.05, the results were considered statistically significant.

Subgroup analysis: None.

Sensitivity analysis: A sensitivity analysis was performed by individually removing each study to determine whether the pooled results changed.

Country(ies) involved: China.

Keywords: platelet-rich plasma; carpal tunnel syndrome; local injection; systematic review; steroid.

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