

INPLASY PROTOCOL

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None declared.

Meta-analysis and systematic review of the effects of three treatment methods on frozen shoulder

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Review question / Objective: The aim of this systematic review is to compare [corticosteroid injection, extracorporeal shock wave therapy, electroacupuncture] and [other treatments] in terms of efficacy and acceptability in the [primary or idiopathic frozen shoulder] to better inform clinical practice. To this end, the proposed systematic review will address the following question: Which is the best choice to improve/reduce [pain degree, shoulder function evaluation, ROM of shoulder, therapeutic effectiveness] in [patients with primary or idiopathic frozen shoulder], [corticosteroid injection, extracorporeal shock wave therapy, electroacupuncture] or [other treatments].

Study designs to be included: Randomized controlled trial of primary frozen shoulder treatment. Two researchers (Zhang and Yang) screened the literature and determined literatures of the final inclusion. Two researchers (Li and Wang) independently evaluated the literature quality and deviation risk, and the quality of the selected literature was mainly evaluated according to the Cochrane deviation risk assessment tool.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 March 2022 and was last updated on 17 March 2022 (registration number INPLASY202230082).

INTRODUCTION

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idiopathic frozen shoulder] to better inform clinical practice. To this end, the proposed systematic review will address the following question: Which is the best choice to improve/reduce [pain degree, shoulder function evaluation, ROM of shoulder, therapeutic effectiveness] in [patients with primary or idiopathic frozen

shoulder], [corticosteroid injection, extracorporeal shock wave therapy, electroacupuncture] or [other treatments].

Condition being studied: Frozen shoulder (FS), also known as scapulohumeral periarthritis, adhesive capsulitis, etc. In traditional Chinese medicine, it is named as "shoulder periarthritis", "Shoulder wind leakage", occurring mostly in middle-aged and elderly people over 50 years old, therefore it is also called as "shoulders of the fifties". Duplay first described the pathological features of frozen shoulder, and termed them "scapulohumeral periarthritis", and in 1934 the term "frozen shoulder" was also proposed by Codman. Pain and limitation of mobility in the patients with frozen shoulder are mainly due to the inflammation and fibrosis of joint capsule, and if normal fibroblasts show inflammatory activation, they will not only secrete proteins related to inflammation but also overexpress fibroblast activation markers, which may be an important factor of chronicity of frozen shoulder due to the complex pathophysiological and pathological mechanisms of the disease. The frozen shoulder is one of the most controversial diseases currently. The treatments can be classified as conservative methods and non-conservative methods. The former includes intra-articular corticosteroid injections, physical therapy (PT), suprascapular nerve blocks (SNB), platelet rich plasma (PRP), etc; The latter includes arthroscopic release, etc. Corticosteroids have been widely used in the treatment of various diseases since their discovery and recognition of their anti-inflammatory and immunosuppressive properties in 1935. Since the long-term effects of corticosteroid injections on frozen shoulder are controversial, this article examines the results over a period of 2-6 weeks to determine whether there are differences in pain, joint mobility and joint function between corticosteroid injections and other treatment modalities. Shock waves have been widely used in the treatment of frozen shoulder because of their physical properties, which produce cavitation and stress effects on the lesion, but a review of the literature reveals that

there is controversy about the superiority of shock wave treatment compared to other treatment modalities. In this paper, we determine whether shockwave is more effective in the treatment of shoulder pain and clinical outcomes in patients with frozen shoulder. Electro-acupuncture is used to obtain qi through acupuncture points and then connect pulsed current, through acupuncture and pulsed current to stimulate acupuncture points to mobilize the qi of meridians in the body to achieve the purpose of treating diseases. In this paper, we have compared the pain, function and clinical efficacy of electroacupuncture in the treatment of frozen shoulder with other treatment modalities in order to provide an evidence-based basis for electroacupuncture in the treatment of frozen shoulder. A subgroup analysis of the effectiveness of multiple treatment modalities versus single treatment modalities was also conducted to provide a more detailed and reliable evidence-based basis for the treatment of frozen shoulder.

METHODS

Participant or population: Patients with primary or idiopathic frozen shoulder.

Intervention: Corticosteroid injection, extracorporeal shock wave therapy, electroacupuncture.

Comparator: Other treatments.

Study designs to be included: Randomized controlled trial of primary frozen shoulder treatment. Two researchers (Zhang and Yang) screened the literature and determined literatures of the final inclusion. Two researchers (Li and Wang) independently evaluated the literature quality and deviation risk, and the quality of the selected literature was mainly evaluated according to the Cochrane deviation risk assessment tool.

Eligibility criteria: Inclusion criteria: (1) The published randomized controlled trials for frozen shoulder treatments at home and

abroad. (2) Some Chinese literature includes Peking University core journals, CSAD journals, CSSCI journals, etc. (3) The literature was published from 2012-2021. (4) A larger number of literature addressing a certain treatment for frozen shoulder enables the meta analysis. (5) The disease type belongs to primary frozen shoulder. (6) Even if it was not made clear whether the blinding method was applied to patients, trial personnel, outcome assessors, the outcome measures were not affected. Exclusion criteria:(1) The full text can not be gained. (2) Non-randomized controlled trials. (3) The disease type belongs to secondary frozen shoulder. (4) The experimental data is incomplete or data type is not the standard deviation based on plus or minus of the mean. (5) The number of documents of a treatment is deficient for meta analysis. (6) The outcome index of a experiment is damaged.

Information sources: Cnki, Wanfang data, VIP Chinese journal Service platform, PubMed, Ebsco, WOS, SCOPUS.

Main outcome(s): 1.Pain evaluation: NPRS, VNS, VAS, SF-MPQ, ASES, SPADI pain index, AND BRS-6. 2.Shoulder function evaluation: QuickDASH, SPADI, Constant Score, CMS, Melle Score, ROM, MBI, Joa scale. 3.ROM of shoulder.4.Therapeutic effectiveness.

Quality assessment / Risk of bias analysis: Two researchers (Zhang and Li) independently evaluated the literature quality and deviation risk, and the quality of the selected literature was mainly evaluated according to the Cochrane deviation risk assessment tool. Due to the small number of inclusion studies, the publication bias can be analyzed by subjective judgment: (1) the fewer inclusion of RCT studies may lead to the risk of publication bias; (2) there are some differences in the choice of outcome indicators, which also cause publication bias.

Strategy of data synthesis: The standardized mean difference (SMD) was used for continuous variables, and the

relative risk (RR) was used for dichotomous variables. The effect size was expressed with 95% CI and the inspection level was set as 0.05. Heterogeneity was tested by I^2 , once $P < 0.1$ and $I^2 > 50\%$, it shows the heterogeneity, then the researchers should adopt the random effects model; conversely, it shows the homogeneity, employing a fixed effects model.

Subgroup analysis: Comparative analysis of multiple treatments combined versus single treatment.

Sensitivity analysis: Because there was heterogeneity in the meta analysis results, it has little effect on the overall heterogeneity by excluding some studies one by one, indicating that the meta analysis results were stable.

Country(ies) involved: China.

Keywords: Freeze shoulder; Corticosteroids; Shockwave; Electroacupuncture; Outcome assessment; System evaluation.

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