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Acupuncture for Somatosensory Disorders: Systematic Review and Meta-Analysis

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Review question / Objective: Somatosensory disorders are common symptoms of clinical, evidence-based guidelines can not provide valid evidence for the treatment of somatic sensory dysfunction acupuncture, because no prior systematic review to evaluate the somatosensory disorders acupuncture treatment. Therefore, we conducted a systematic review and meta-analysis of randomized controlled trials to evaluate the effects of acupuncture in the treatment of somatosensory disorders.

Information sources: Eight databases, including PubMed, web of science, Cochrane, Embase, China Biomedical Literature System, CNKI, VIP and Wan fang database, were searched for RCTs based on acupuncture for Somatosensory Disorders.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 September 2021 and was last updated on 22 September 2021 (registration number INPLASY202190072).

treatment. Therefore, we conducted a systematic review and meta-analysis of randomized controlled trials to evaluate the effects of acupuncture in the treatment of somatosensory disorders.

Condition being studied: Somatosensory Disorders are disorders of sensory information received from superficial and deep regions of the body. The

INTRODUCTION

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somatosensory system conveys neural impulses which pertain to proprioception, tactile sensation, thermal sensation, pressure sensation, and pain. They include Hyperalgesia, Hyperesthesia, Hypesthesia and Paresthesia. Peripheral nervous system diseases, Spinal cord diseases and Brain diseases may be associated with impaired or abnormal somatic sensation. Somatosensory disorders affect motor function, thereby reducing the independence of the activities of daily living, which greatly reduces the quality of life of patients. For the somatosensory disorders, is currently no optimal treatment. Some alternative therapies are often used to treat sensory disorders, including physical therapy, massage and yoga, etc. As a low-cost, low-risk alternative medicine therapy, acupuncture is usually used to help treat sensory disorders. Studies have found that acupuncture has a certain effect on sensory disorders after cerebral infarction, diabetic peripheral neuropathy and cervical spondylopathy. This may be related to the fact that acupuncture promotes endogenous neurogenesis through a variety of ways, regulate synaptic plasticity and the secretion of neurotrophic factors and neurotransmitters. Although there is evidence that acupuncture is effective in treating somatosensory disorders, some studies have shown that acupuncture is as effective as placebo in treating sensory disorders. Therefore, this study aims to evaluate the effects of acupuncture and other therapies on the clinical symptoms of sensory disorders, the effect of sensory nerve conduction velocity and the level of inflammatory factors through unified inclusion criteria.

METHODS

Search strategy: Eight databases, including PubMed, web of science, Cochrane, Embase, China Biomedical Literature System, CNKI, VIP and Wan fang database, were searched for RCTs based on acupuncture for Somatosensory Disorders. The search period ran from the start date of each database to June 30, 2021. The search strategy was based on the

principles of PICOS (overall, intervention, comparison, outcome, and study design), and was done using a combination of subject terms and free words, identified by repeated pre-searching, and supplemented by manual searches and reference tracking. Chinese search terms included acupuncture (针灸, 针刺, 针法), acupuncture therapy (针灸疗法, 针刺疗法), warming acupuncture (温针灸), electroacupuncture (电针), somatic sensory disorder (躯体感觉障碍), hyperalgesia (痛觉过敏), Hypoesthesia (感觉减退), Paresthesia (感觉异常), proprioceptive disorder (本体感受障碍), thermal sensory disorder (热感觉障碍), dyesthesia (感觉迟钝), tactile (触觉), feeling insufficiency (感觉不全), clinical research (临床研究), clinical trial (临床试验), clinical controlled trial (临床对照试验), Randomized Controlled Trial (随机对照试验), Practical Clinical Trial (实用性临床试验), Randomized Controlled Clinical Trial (随机对照临床实验), Clinical Observation (临床观察), Effect Observation (效果观察).

Participant or population: Patients with Somatosensory disorders.

Intervention: Acupuncture.

Comparator: Drug therapy or physical therapy.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: Inclusion Criteria (1) The research objects are patients with somatosensory disorders that include Hyperalgesia, Hyperesthesia, Hypesthesia and Paresthesia. (2) Intervention measures: The treatment group took acupuncture alone or acupuncture combined with other treatment methods. The control group took conventional symptomatic treatment, conventional medication, other physical therapy or placebo treatment. (3) Outcomes: sensory disorders cure rate and effective rate. The sensory conduction

velocity of the median nerve, common peroneal nerve and superficial peroneal nerve. Levels of inflammatory factors. (4) The type of study was a randomized controlled trial. Exclusion Criteria(1) No somatosensory disorders cervical spondylosis, lumbar and other diseases. (2) The treatment group took auricular acupuncture, hydro-acupuncture, bloodletting therapy, transcutaneous electrical stimulation or acupressure. The control group was combined with other types of acupuncture treatment on the basis of conventional treatment. (3) We also excluded studies in which acupuncture is not the only change in intervention measures. For example, the treatment group used acupuncture combined with traditional Chinese medicine and conventional treatment while the control group only used conventional treatment. (4) The sample size of any group in the treatment group or the control group was less than 30. (5) Excluded reviews, animal experiments, case reports, conference papers and non-randomized controlled trials. (6) Excluded studies with duplicate publications and incomplete data.

Information sources: Eight databases, including PubMed, web of science, Cochrane, Embase, China Biomedical Literature System, CNKI, VIP and Wan fang database, were searched for RCTs based on acupuncture for Somatosensory Disorders.

Main outcome(s): The main result was the cure rate. The calculation method was $\frac{\text{cured patients}}{\text{total number of cases}} \times 100\%$, and the cure criterion is that all the clinical symptoms of somatosensory disorder disappear.

Additional outcome(s): The secondary result is the effective rate, and the calculation method is $\frac{\text{number of (cured + markedly effective + effective)}}{\text{total number of cases}} \times 100\%$. The cure criterion is that all clinical symptoms disappear, the effective criterion is that the clinical symptoms are significantly reduced than before, and the effective symptom is that the clinical symptoms are improved. The sensory

conduction velocity of the median nerve, common peroneal nerve and superficial peroneal nerve. The level of inflammatory factors.

Data management: Noteexpress.

Quality assessment / Risk of bias analysis: One researcher (Yibing Li) assessed the possible risks in the trial, and another researcher (Bangqi Wu) checked it. Any differences encountered were resolved by a third researcher (Wang Xuhui). The risk of bias criteria was based on the Cochrane Collaboration Network's RCT criteria to qualitatively evaluate seven aspects of random sequence generation, distribution concealment, subject and investigator blinding, blinding of outcome assessors, incomplete outcome data, and selective reporting, and were evaluated as "low risk of bias," "uncertain risk of bias," and "high bias risk".

Strategy of data synthesis: The literature data were processed using Stata (v15.1); combined effect sizes and heterogeneity tests were performed, and forest plots were drawn. The literature outcome indicators were dichotomous variables, and the effect size was chosen as relative risk (RR) with an effect size of 95% of the confidence interval (95% CI). The literature outcome indicators was the continuous variable, the effect size selection mean difference (WMD). The meta-analysis followed strict PRISMA guidelines and tests of heterogeneity were performed using P-values and I². If there was no statistical heterogeneity between the results of these studies ($I^2 \leq 50\%$, $P > 0.1$), a fixed-effects model was selected (dichotomous variables using the M-H method, continuous variables using the I-V method). If there was statistical heterogeneity between studies, the source of heterogeneity was further explored using meta-regression or subgroup analysis, and if the source of heterogeneity was unclear, a random-effects model (D+L method) was used for analysis. The funnel chart and Egger's tests were used together to determine whether there is a publication offset.

Subgroup analysis: The acupuncture frequency was divided into once a day, once every 2 to 3 days, once more than 3 days for regression analysis. The intervention methods were divided into four groups: acupuncture plus medication vs medication, acupuncture plus physiotherapy vs physiotherapy, acupuncture vs medication, acupuncture vs physiotherapy.

Sensitivity analysis: After 16 trials were subjected to sensitivity analysis, it was found that 2 studies had a greater impact on heterogeneity. After the sensitivity analysis of 17 trials was conducted, it was found that there was no research that had a significant impact on the test results.

Language: English and Chinese.

Country(ies) involved: China.

Keywords: Acupuncture; Somatosensory Disorders; Acupuncture frequency.

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