INPLASY PROTOCOL

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None declared.

Efficacy of transcutaneous electrical acupoint stimulation on upper limb function after stroke: a meta-analysis

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Review question / Objective: To systematically evaluate the efficacy of transcutaneous electrical acupoint stimulation (TEAS) on upper limb motor dysfunction in stroke patients. P: Stroke patients. I: TEAS was performed on the basis of the control group. C: Routine rehabilitation training, which could be combined with transcutaneous electrical acupoint stimulation false stimulation, basic drug therapy or other sports therapy. O: Fugl-Meyer Assessment-Upper Extremity (FMA-UE), FMA wrist and hand part, FMA hand part, Modified Barthel Index (MBI) and Modified Ashworth Index (MAS). S: RCT.

Information sources: Search PubMed, Web of Science, Cochrane Library, Embase, CNKI, Wanfang, Vip, and China Biology Medicine (CBM) Database, from the establishment of the database to December 2022.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 January 2023 and was last updated on 12 January 2023 (registration number INPLASY202310036).

INTRODUCTION

Review question / Objective: To systematically evaluate the efficacy of transcutaneous electrical acupoint stimulation (TEAS) on upper limb motor dysfunction in stroke patients. P: Stroke patients. I: TEAS was performed on the basis of the control group. C: Routine rehabilitation training, which could be combined with transcutaneous electrical acupoint stimulation false stimulation, basic drug therapy or other sports therapy. O: Fugl-Meyer Assessment-Upper Extremity (FMA-UE), FMA wrist and hand part, FMA hand part, Modified Barthel Index (MBI) and Modified Ashworth Index (MAS). S: RCT.

Rationale: Stroke, including intracerebral hemorrhage and cerebral infarction, is the leading cause of death and disability in adults in China, which is characterized by high morbidity, mortality and disability. The

incidence of stroke has been increasing in recent years, and there is a trend toward younger age, the disability rate is up to more than 85%, most of them will be left with upper limb dysfunction, and still cannot fully recover within 6 months, which severely limits the daily life of patients and social participation. Therefore, adopting effective rehabilitation means to improve upper extremity motor function is particularly important to improve patient independence and quality of life.

Transcutaneous electrical acupoint stimulation is a novel rehabilitation treatment technique that combines traditional Chinese medicine acupoints with low-frequency pulsed electrical stimulation, which has been increasingly applied in China for post-stroke treatment in recent years, and its efficacy has been confirmed to be similar to traditional acupuncture, and it is safe and effective, noninvasive, easy to operate, patient compliance, and other therapies with high clinical applicability. Because teas involves traditional Chinese medicine meridian theory, its research is mostly focused at home, while there are few reports abroad. At present, there have been clinical studies in China preliminarily showing that teas can improve the motor function of the upper limbs and the ability to perform activities of daily living in patients with stroke, but there are still few related studies, and its efficacy lacks evidence-based medical evidence.

Therefore, this study selected randomized controlled trials to evaluate the therapeutic effects of teas on upper extremity motor dysfunction after stroke through meta-analysis, with a view to providing a reliable basis for clinical rehabilitation.

Condition being studied: Stroke with upper limb motor dysfunction, stable vital signs.

METHODS

Search strategy: PubMed: ((Transcutaneous electrical acupoint stimulation) OR (Electrical stimulation acupoints) OR (Electrical stimulation of acupuncture points)) AND ((stroke) OR (apoplexy) OR (Cerebral embolism) OR (Cerebral peduncles) OR (cerebral hemorrhage) OR (cerebrovascular accident) OR (hemiplegia) OR (semiplegia) OR (hemiplegic)) AND ((upper limb) OR (upper extremity) OR (hand)).

Participant or population: ① Stroke was diagnosed by CT or MRI and fulfilled the national or internationally recognized diagnostic criteria in the literature publication, ② Patients' age ≥ 18 years; ③ Disease duration ≥ 2 weeks, stable vital signs, Brunnstrom stages I-V; ④ Upper limb motor dysfunction was present.

Intervention: The test group was treated with transcutaneous electrical acupoint stimulation on the basis of the control group.

Comparator: The control group received routine rehabilitation training, which could be combined with transcutaneous electrical acupoint stimulation false stimulation, basic drug therapy or other sports therapy.

Study designs to be included: RCT.

Eligibility criteria: Exclusion criteria: ① Conference papers, systematic evaluation and summary; ② It has nothing to do with the research topic; ③ The intervention measures are inconsistent; ④ Animal experiment; ⑤ The outcome indicators are inconsistent; ⑥ Duplicate, incomplete or incorrect data; ⑦ The design of the experimental study is inconsistent.

Information sources: Search PubMed, Web of Science, Cochrane Library, Embase, CNKI, Wanfang, Vip, and China Biology Medicine (CBM) Database, from the establishment of the database to December 2022.

Main outcome(s): 1. Fugl-Meyer Assessment-Upper Extremity (FMA-UE). 2. FMA wrist and hand part. 3. FMA hand part. 4. Modified Barthel Index (MBI). 5. Modified Ashworth Index (MAS).

Additional outcome(s): 1. Action Research Arm Test (ARAT). 2. Wolf Motor Function Test (WMFT).

Data management: According to the retrieval strategy, the retrieved documents are imported into the Endnote X9 software. First, two researchers conduct independent screening, screen the title, abstract and full text according to the inclusion and exclusion criteria, extract the data and check each other. If there is any discrepancy, the third researcher will assist in judgment. The content of data extraction includes: ① basic information (First author, year of publication, experimental grouping, number of cases, gender ratio, age of patients, course of disease, intervention and control measures, stimulating acupoints, electric stimulation time, and course of treatment). ② Methodological information of research design (Randomized scheme, blind method, etc.). ③ Outcomes data.

Quality assessment / Risk of bias analysis: The bias risk assessment was conducted by two researchers according to the Cochrane literature quality evaluation item. Each risk assessment included three levels: low risk, unclear and high risk. At the same time, the revised Jadad scale was used to score the quality of the included documents, with 1 to 3 points of low quality and 4 to 7 points of high quality. If there is any dispute about the evaluation result, it shall be discussed and decided with the third researcher.

Strategy of data synthesis: Revman5.4 software was used to perform meta-analysis of study data. Count data were selected to be expressed as odds ratio (or) or relative risk (RR). Measurement data were selected to be presented as weighted mean difference (MD) or standardized mean difference (SMD), and each effect size was estimated as a point estimate and 95% confidence interval (CI). Between study heterogeneity was analyzed by 2 test, and when $p > 0.1$, $I2 < 50\%$, which suggested no obvious heterogeneity among studies, fixed effect model was selected for analysis. When $p \leq 0.1$, $I2 \geq 50\%$, which suggested significant heterogeneity among studies, random effects model was used to analyze.

Subgroup analysis: If there was heterogeneity in the analysis results, subgroup analysis was performed by course, site of electrical stimulation, intensity of electrical stimulation, etc.

Sensitivity analysis: Sensitivity analysis was performed by Revman software after removing one or two studies.

Language restriction: Chinese and English.

Country(ies) involved: China.

Keywords: Transcutaneous electrical acupoint stimulation; Stroke; Upper limb motor function; Meta-analysis.

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