INPLASY

Comparisons of scalp acupuncture therapies for the treatment of post-stroke hemiparesis: A systematic review and network meta-analysis

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ADMINISTRATIVE INFORMATION

INTRODUCTION

Review question / Objective Participant: Post-stroke hemiparesis patients. Intervention/Comparison: Scalp acupuncture(SA), scalp acupuncture with electric stimulation(eSA), scalp acupuncture with manipulation(mSA), rehabilitation(R), western medicine(WM). Outcome: Primary outcomes: (1) FMA, a stroke-specific, performance-based index, as motor function assessment. (2) FMA for Upper Extremity (FMA-UE) (3) FMA for Lower Extremity (FMA-LE). Secondary outcomes: (1) the activities of daily living (ADL) measured by the Barthel Index (BI) and the Modified Barthel Index (MBI); (2) risk ratio (RR) of the presence of severe adverse effect. Study design: Randomized controlled trial(RCT).

Rationale Post-stroke hemiparesis significantly impacts the physical performance and health-related quality of life in patients. Previous studies have shown scalp acupuncture therapy (SA) significantly improving motor function and daily life activities among post-stroke hemiparesis patients. This study aimed to explore the effects of SA combined therapies on Fugl-Meyer assessment (FMA) and activity of daily lining (ADL) in post-stroke hemiparesis patients to provide evidence-based clinical recommendations.

Condition being studied Hemiparesis is a common after-effect of stroke that effects on one side of the body, primarily affecting ADL and HRQL. Common hemiparesis symptoms include muscle weakness or stiffness, muscle spasticity or permanently contracted muscle, difficulty walking or grabbing objects, poor balance, decreased movement precision, and lack of motor coordination, depending on their stroke severity.

METHODS

Search strategy We searched five major electro-databases, including three English databases (PubMed, Embase, and the Cochrane library) and two Chinese databases (Airiti Library and China National Knowledge Infrastructure). Relevant articles were searched from initiation until December 2022 without language limitation. The following keywords used for the search were: "stroke" and "scalp acupuncture" in English databases and Chinese synonyms of the keywords in Chinese databases.

Participant or population Post-stroke hemiparesis patients.

Intervention Scalp acupuncture(SA), scalp acupuncture with electric stimulation(eSA), scalp acupuncture with manipulation(mSA), rehabilitation(R), western medicine(WM).

Comparator Scalp acupuncture(SA), scalp acupuncture with electric stimulation(eSA), scalp acupuncture with manipulation(mSA), rehabilitation(R), western medicine(WM).

Study designs to be included Randomized controlled trial (RCT).

Eligibility criteria Only randomized controlled trials (RCTs) were included in the analysis. The target population included was patients diagnosed with post-stroke hemiparesis. All the retrieved studies comprised at least two comparative treatment arms, one arm with interventions such as scalp acupuncture, scalp acupuncture with electric stimulation or scalp acupuncture with manipulation, and the other arm serves as rehabilitation or conventional western medicine treatment.We excluded studies that are non-RCTs and studies in animal experiments without clinical trials. The treatment arm using herbal medicine or manual acupuncture were also excluded.

Information sources We searched five major electro-databases, including three English databases (PubMed, Embase, and the Cochrane library) and two Chinese databases (Airiti Library and China National Knowledge Infrastructure).

Main outcome(s) The primary outcomes included: (1) FMA, a stroke-specific, performance-based index, as motor function assessment. (2) FMA for Upper Extremity (FMA-UE) (3) FMA for Lower Extremity (FMA-LE). We recorded the outcomes before and after the intervention using mean differences (MD) from the baseline. The values represent the motor improvement after the intervention.

Additional outcome(s) Secondary outcomes: (1) the activities of daily living (ADL) measured by the Barthel Index (BI) and the Modified Barthel Index (MBI); (2) risk ratio (RR) of the presence of severe adverse effect.

Data management We censored all the retrieved articles and extracted data using a preordained form. The following information were recorded including author, year, patient age, sample size, stroke type (ischemic or hemorrhage stroke), duration of stroke, intervention arms, SA treatment details (retention time, frequency, total treatment course, acupuncture point formula, and the SA point stimulation details). We recorded the outcomes (FMA, FMA-UE, FMA-LE, BI, and MBI) before and after the intervention using mean differences (MD) from the baseline. The values represent the motor improvement after the intervention.

Quality assessment / Risk of bias analysis Two reviewers (YFW and WYC) reviewed the methodological quality of the selected studies independently using the Quality Assessment of Controlled Intervention Studies tool (developed by the National Heart, Lung, and Blood Institute, National Institutes of Health). Discrepancies or issues between the reviewers were resolved by consulting with a third reviewer (PCH) as an arbiter.

Strategy of data synthesis We summarized the value of improvement of the retrieved studies with 95% confidence interval (CI) as the effect size for measuring the treatment effects. All graph generation and statistical analyses were performed using the statistical software RStudio (Version 2023.03.0+386).33 To compare the effects of different SA treatments, rehabilitation and western medicine on motor improvement and ADL in treating patients with post-stroke hemiparesis, NMA were conducted using the packages netmeta, ggplot2, and reshape2. A random-effects network meta-analysis was performed using a consistency model. Each pair of interventions was compared by the MD. The P-score was calculated by the ranking probabilities for each intervention and used to determine the ranking. P-score is an index between 0 and 1, and the larger the P-score, means the better the intervention.

Subgroup analysis We didn't perform subgroup analysis.

Sensitivity analysis The inconsistency assumption was assessed using a node-splitting model and design-by-treatment interaction model.

Language restriction No.

Country(ies) involved Taiwan.

Other relevant information No

Keywords Post-stroke hemiparesis, scalp acupuncture, systematic review, network meta-analysis.

Contributions of each author
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