INPLASY PROTOCOL

Corresponding author:
Haoming Huang

fsplscallmejo@live.com

Author Affiliation:
Guangzhou University of Chinese Medicine.

Review Stage at time of this submission: **Formal screening of search results.**

Conflicts of interest:
None declared.

Neural Activities of Acunpuncture Stimulation at ST 36 (zusanli): A Systematic Review and Meta-Analysis of functional MRI

Huang, HM[1]; Zhao, WX[2]; Zeng, JC[3]; Lin, GH[4]; Qiu, SJX[5].

Review question / Objective: To study the transient and long-term neural effects when acupuncture at ST36 acupoint in healthy subjects.

Condition being studied: The brain responses of acupuncturing at ST 36 in healthy subjects.

Information sources: Electronic databases: PubMed, Web of Science, Google Scholar, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), VIP Database, and Wanfang Database. All databases will be searched from inception to Dec 15, 2021. The bibliographies of articles and reviews will be hand-searched and retrieved for any additional relevant study.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 December 2021 and was last updated on 06 December 2021 (registration number INPLASY2021120035).

INTRODUCTION

Review question / Objective: To study the transient and long-term neural effects when acupuncture at ST36 acupoint in healthy subjects.

Rationale: ST 36 (zusanli) is commonly used in the clinical practice of acupuncture in Chinese medicine. However, how acupuncture at ST 36 modulates neural activity across various brain regions is still lacking unclear. The advances in noninvasive neuroimaging techniques, such as EEG, MRI, fNIRS, etc., allow researchers to study the mechanism of acupuncture in vivo or even in humans. There are emerging neuroimaging studies,

especially functional MRI, that explored the acupuncture responses in the brain when acupuncture at ST 36, nonetheless, the results are heterogeneous. Thus, it is necessary to conduct a comprehensive analysis of acupuncturing at ST36 for consistent conclusions and understanding of the neurobiological mechanisms.

Condition being studied: The brain responses of acupuncturing at ST 36 in healthy subjects.

METHODS

Search strategy: The following terms will be used for literature search, ("ST 36" or "ST36" or "zusanli") and ("fMRI" or "functional MRI" or "functional magnetic resonance imaging").

Participant or population: Healthy subjects.

Intervention: Acupuncture at ST36.

Comparator: Sham acupuncture ("non-penetrate needling" or "Sham acupuncture").

Study designs to be included: Task-based functional MRI.

Eligibility criteria: Inclusion: (1) the whole-brain analysis task-based fmri study; (2) conducted in healthy subjects with sham or placebo needling as control; (3) studies that reported peak stimulation coordinates in MNI/Talairach coordinate system with corresponding cluster size and cluster statistics (Z or T values); (4) peer-reviewed journal articles. Exclusion: (1) region-of-interest studies; (2) reviews, meta-analyses, or animal studies.

Information sources: Electronic databases: PubMed, Web of Science, Google Scholar, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), VIP Database, and Wanfang Database. All databases will be searched from inception to Dec 15, 2021. The bibliographies of articles and reviews will be hand-searched and retrieved for any additional relevant study.

Main outcome(s): Stimulated brain regions (in MNI/Talairach coordinate), cluster size (mm).

Additional outcome(s): Meta-regression for the associations between acupuncture techniques (maneuvers, such as persevering time, intensity, etc.) and brain activities whenever there are appropriate numbers of studies.

Data management: The following domains will be extracted from the original studies: subject number, age, sex, experimental design, and neuroimaging processing software (SPM, FSL, ANFI, etc.), and the peak MNI/Talairach spatial coordinates with corresponding statistics (Z or T values) and cluster sizes.

Quality assessment / Risk of bias analysis: Appropriate tools will be used for different study designs. ROB for RCTs, and MINORS for non-randomized comparative study.

Strategy of data synthesis: SDM-PSI will be used in the current work for summarizing the peak coordinates of brain activities in ST36 acupuncture stimulation (FWE-corrected followed by TFCE with 1000 permutations), and the results will be thresholded to the statistical significance level of $p < 0.05$.

Subgroup analysis: Subgroups analysis will be performed if there are enough studies for left/right ST 36 Stimulations.

Sensitivity analysis: Re-analysis will be conducted after excluding the included studies one by one to test the robustness of the final results.

Language: English, Chinese.

Country(ies) involved: China.

Keywords: Neural activity; fmri; Acupuncture; ST 36; Meta-analysis.

Contributions of each author:
Author 1 - Haoming Huang - The author drafted the manuscript.
Email: fshuanghaoming@gmail.com

Author 2 - Weixuan Zhao - The author contributed to the development of the selection criteria and the risk of bias assessment strategy.
Email: natalie1230@qq.com

Author 3 - Jingchun Zeng - The author provided statistical expertise.
Email: tcm_zjc@126.com

Author 4 - Guohua Lin - The author read, provided feedback, and approved the final manuscript.
Email: tcmlin-801@163.com

Author 5 - Shujun Qiu - The author read, provided feedback, and approved the final manuscript.
Email: qiu-sj@163.com