

# INPLASY PROTOCOL

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None declared.

## The effects of Acupuncture Therapy in Migraine : An Activation Likelihood Estimation Meta-analysis

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**Review question / Objective:** Our objective is to integrate findings from the literature and identify changes in the brain area before and after acupuncture for patients with migraine through a systematic review and a meta-analysis of brain activity studies.

**Condition being studied:** Migraine is an episodic, recurrent dysfunction of brain excitability that is characterized by attacks of moderate or severe unilateral throbbing and pulsating headaches. It is reported that acupuncture treatment is effective for migraine. Acupuncture is also able to relieve a series of negative emotions caused by long-term pain and effectively improve the quality of life. However, the central mechanism of acupuncture treatment for migraine has not been completely clarified. Functional magnetic resonance imaging (fMRI) can observe various brain activities of the human body under specific conditions, which has been widely used in the research on the central analgesic mechanism of acupuncture. The fMRI technology can directly show the central location of the acupuncture effect, and meta-analysis of fMRI studies on acupuncture intervention in migraine can help us better understand its neural mechanism.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 November 2022 and was last updated on 06 November 2022 (registration number INPLASY2022110026).

### INTRODUCTION

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with migraine through a systematic review and a meta-analysis of brain activity studies.

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## METHODS

**Participant or population:** Patients with migraine defined with any version of the International Classification of Headache Disorders.

**Intervention:** Acupuncture alone. (Electro-acupuncture and Manual acupuncture).

**Comparator:** None.

**Study designs to be included:** Randomized controlled trials and clinical controlled trials will be included. The studies published in Chinese and English will be included.

**Eligibility criteria:** 1)The patients were diagnosed with migraine by any internationally recognized or accepted clinical guideline or consensus like The International Classification of Headache Disorders, 3rd edition (beta version). 2) The intervention involved electro-acupuncture and manual acupuncture; no limitations on manipulation methods of acupuncture, acupoint selection, and duration of acupuncture. 3)The studies reported pre- and post-acupuncture treatment neuroimaging results (ReHo, ALFF, fALFF)

via fMRI using standard anatomical template. 4)Both randomized controlled trials and clinical controlled trials were included.

**Information sources:** We will search PubMed/Medline, EMBASE, Web of Science, Cochrane Library, China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP), Wanfang Database, and China Biology Medicine (CBM) from inception onwards. Both Medical Subject Headings (MeSH) and free-text words related to acupuncture, migraine, and functional magnetic resonance imaging will be used for searching relevant articles. We will manually search gray literatures, reference lists of identified studies, and relevant websites ([www.chictr.org.cn](http://www.chictr.org.cn), [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov)) and consult experts in this field.

**Main outcome(s):** The brain activation and deactivation regions were identified by ALE meta-analysis.

**Quality assessment / Risk of bias analysis:** The quality will be assessed independently by two reviewers. Any disagreements will be resolved through discussion and adjudication by a third reviewer. There has been no standard checklist for quality assessment of individual functional neuroimaging studies. The quality of all included studies will be assessed using a modified version of the checklist that was based on those used in previous meta-analyses. The checklist was used to assess the methodological quality of individual functional neuroimaging studies. The checklist contains 2 domains (sample characteristics, methodology and reporting) with 13 items.

**Strategy of data synthesis:** We will provide a quantitative synthesis of the findings from the included studies by using the activation likelihood estimation (ALE) method. The ALE analysis will be implemented in Ginger-ALE 2.3.6 software.

**Subgroup analysis:** None.

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**Sensitivity analysis:** We will carry out a sensitivity analysis using the exclusion method. That is, all studies are excluded one by one, and the remaining studies will be reanalyzed to determine the stability of the results.

**Language restriction:** No language restrictions.

**Country(ies) involved:** China.

**Keywords:** acupuncture, migraine, functional magnetic resonance imaging, meta-analysis, activation likelihood estimation.

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