

INPLASY PROTOCOL

To cite: Zhou et al. The effects of acupuncture therapy in Parkinson's disease: A SDM-PSI meta-analysis of functional magnetic resonance imaging studies. Inplasy protocol 202320031. doi: 10.37766/inplasy2023.2.0031

Received: 07 February 2023

Published: 07 February 2023

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Support: National Natural
Science Fund.

**Review Stage at time of this
submission:** The review has
not yet started.

Conflicts of interest:

None declared.

The effects of acupuncture therapy in Parkinson's disease: A SDM-PSI meta-analysis of functional magnetic resonance imaging studies

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Review question / Objective: The objective of this meta-analysis is to integrate findings from the functional magnetic resonance imaging studies and identify brain activity changes after acupuncture treatment in patients with Parkinson's Disease using a SDM-PSI method.

Eligibility criteria: We will include studies that met the following criteria:1) Patients isdiagnosed with Parkinson's disease by an internationally recognized or accepted clinical guideline or consensus, such as the UK PD Society Brain Bank clinical diagnostic criteria, Diagnosis and pharmacological management of Parkinson's disease: Summary of SIGN guidelines. There will be no restriction on the gender, race of patients.2) The intervention will be acupuncture therapy (e.g., manual acupuncture, electroacupuncture, scalp acupuncture, ear acupuncture, etc.) or combined with conventional medical therapy (non-traditional Chinese medicine). 3) Studies provide whole-brain neuroimaging results (ReHo, ALFF, fALFF) using fMRI with standard anatomical templates;4) Randomized controlled trials and controlled clinical trials will be included.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 February 2023 and was last updated on 07 February 2023 (registration number INPLASY202320031).

INTRODUCTION

Review question / Objective: The objective of this meta-analysis is to integrate findings from the functional magnetic resonance imaging studies and identify brain activity changes after acupuncture

treatment in patients with Parkinson's Disease using a SDM-PSI method.

Condition being studied: Parkinson's disease (PD) is the second most common neurodegenerative disease and is commonly associated with non-motor and motor disorders.

According to epidemiological statistics, in industrialized countries, the estimated prevalence of PD is 1.0% in people older than 60 years and 3.0% in people older than 80 years. The incidence rates of PD are estimated to range between 8 to 18 per 100,000 person-years.

Mounting evidence supports that acupuncture treatment is effective for patients with PD, which has the advantages of good tolerance and few side effects. In addition, acupuncture is able to relieve the symptoms of PD patients and improve their quality of life. However, the central mechanism of acupuncture treatment for PD has not been completely clarified.

Functional magnetic resonance imaging (fMRI), a non-invasive means of inferring function-specific neuronal activity, has been used to evaluate brain activity objectively and visually. Researchers have utilized fMRI to investigate the changes in brain activity of patients with PD after acupuncture, but their findings are inconsistent.

Therefore, we will conduct a meta-analysis of fMRI data using the Seedbased d Mapping with Permutation of Subject Images (SDM-PSI), to elucidate the underlying brain regions modulation mechanisms of acupuncture for PD.

METHODS

Participant or population: Patients with Parkinson's disease which is diagnosed by internationally recognized or accepted clinical guidelines or consensus.

Intervention: Various acupuncture techniques (manual acupuncture, electroacupuncture, scalp acupuncture, ear acupuncture, etc.) or combined with conventional medical therapy (non-traditional Chinese medicine). Intervention group is patients after acupuncture treatment (manual acupuncture, electroacupuncture, scalp acupuncture, ear acupuncture, etc.).

Comparator: Comparator is patients before acupuncture treatment (manual acupuncture, electroacupuncture, scalp acupuncture, ear acupuncture, etc.).

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

Eligibility criteria: We will include studies that met the following criteria:1) Patients isdiagnosed with Parkinson's disease by an internationally recognized or accepted clinical guideline or consensus, such as the UK PD Society Brain Bank clinical diagnostic criteria, Diagnosis and pharmacological management of Parkinson's disease: Summary of SIGN guidelines. There will be no restriction on the gender, race of patients.2) The intervention will be acupuncture therapy (e.g., manual acupuncture, electroacupuncture, scalp acupuncture, ear acupuncture, etc.) or combined with conventional medical therapy (non-traditional Chinese medicine). 3) Studies provide whole-brain neuroimaging results (ReHo, ALFF, fALFF) using fMRI with standard anatomical templates;4) Randomized controlled trials and controlled clinical trials will be included.

Information sources: We will perform a systematic search on PubMed, Embase, Cochrane Library, Chinese Biomedical Literature Database (CBM), China National Knowledge Infrastructure (CNKI), Chinese Science and Technology Periodical Database (VIP), and Wanfang database (Wanfang Data) from inception onwards. Both Medical Subject Headings (MeSH) and free-text words related to acupuncture, Parkinson's disease, and magnetic resonance imaging will be used to build a search strategy. We will manually search gray literature, reference lists of identified studies, and relevant websites (www.chictr.org.cn, www.ClinicalTrials.gov) and consult experts in this field.

Main outcome(s): Outcomes will be the brain activation and deactivation regions.

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. The quality of all included studies will be assessed using a modified version of the checklist based on previous meta-analyses. The checklist is used to assess the methodological quality of individual functional neuroimaging studies, which contains two 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 Seed-based d Mapping with Permutation of Subject Images (SDM-PSI) (version 6.22, <https://www.sdmproject.com/>).

Subgroup analysis: None.

Sensitivity analysis: If possible, we will carry out a sensitivity analysis using the exclusion method. That is, all studies will be 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, Parkinson's disease, functional magnetic resonance imaging, meta-analysis, Seed-based d mapping.

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