

INPLASY

Analysis of Acupoint Selection and Combinations in Acupuncture Treatment of Endometriosis: A Protocol for Data Mining

INPLASY202690092

doi: 10.37766/inplasy2026.9.0092

Received: 21 September 2026

Published: 22 September 2026

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ADMINISTRATIVE INFORMATION

Support - No support.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202690092

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 September 2026 and was last updated on 22 September 2026.

INTRODUCTION

Review question / Objective To identify the commonly used acupoints, recurring acupoint combination patterns, and candidate protocols in acupuncture treatment for endometriosis through data mining of published clinical studies.

Rationale Endometriosis is a common gynecological disease that significantly impairs patients' quality of life. Acupuncture is widely used for endometriosis-associated pain, but acupoint selection varies considerably across clinical studies due to differences in practitioners' theoretical understanding and clinical experience, and no unified standard exists. Previous systematic reviews and meta-analyses have focused on whether acupuncture as a whole improves symptoms, rather than on how acupoints are selected and combined. To date, no study has systematically examined the acupoint selection and combination patterns used in acupuncture

treatment for endometriosis. Data mining can identify frequently used acupoints and combination patterns from published clinical literature, providing a basis for standardizing acupoint selection and informing future prospective trials. This study therefore aims to apply data mining techniques to analyze the patterns of acupoint selection and combinations in acupuncture treatment for endometriosis.

Condition being studied Endometriosis is a chronic, inflammatory, estrogen-dependent gynecological disease commonly seen in women of reproductive age. It is characterized by the presence of active endometrial tissue outside the uterine cavity. Endometriosis affects approximately 10%–15% of reproductive-aged women worldwide, and its prevalence is even higher among women with unexplained infertility. The most common symptoms include dysmenorrhea, pelvic pain, dyspareunia, and infertility, which severely impair patients' quality of life, work capacity, and psychological well-being. Current

(4) Literature not published in Chinese or English.

Information sources Electronic databases to be searched include Web of Science (WOS), PubMed, Embase, Cochrane Library, Wanfang, Chongqing VIP database, China National Knowledge Infrastructure (CNKI), and the Chinese Biomedical Literature Database (CBM). Only literature in Chinese and English will be included. If data are missing, we will contact the corresponding author by email to obtain the original or supplementary data.

Main outcome(s) The primary outcome is the pattern of acupoint selection and combinations in acupuncture treatment for endometriosis, identified through data mining of published clinical studies. This includes: (1) the frequency of acupoint use; (2) the meridian distribution of acupoints; (3) the body regions of acupoints; (4) the attributes of specific acupoints; and (5) the core acupoint combinations and compatibility patterns identified by association rule analysis, factor analysis, cluster analysis, and decision tree analysis.

Additional outcome(s) Additional outcomes include: (1) the number and distribution of included studies; (2) the methodological quality of included studies assessed by RoB 2 (for RCTs) and ROBINS-I (for NRSIs); (3) the reporting quality of acupuncture interventions assessed by the STRICTA checklist; and (4) the stability of the data-mining models, including the stability of clusters (assessed by bootstrap resampling) and the performance of the decision tree model (assessed by 10-fold cross-validation).

Data management Literature records retrieved from the searches will be imported into NoteExpress 4.3 reference management software. Duplicate records will be removed using author, year, title, and journal as duplicate-check fields, followed by manual screening to eliminate any remaining duplicates. Two reviewers (Linglin Dai and Yin Zhang) will independently screen titles and abstracts, and then full texts, with disagreements resolved through discussion with a third author (Lili Wang).

Data from the remaining literature will be extracted and entered into WPS Spreadsheets (version 12.1.0.26375) to establish an acupoint prescription database. Prescriptions containing adjunct acupoints will be structured as "one group of primary acupoints with one group of adjunct acupoints." All meridian and auricular acupoints will be standardized according to GB/T 12346-2021 and GB/T 13734-2008, respectively.

Basic information such as anatomical location, corresponding meridian, and specific acupoint attributes will also be recorded.

Quality assessment / Risk of bias analysis The methodological quality of included studies will be assessed using the Cochrane Risk of Bias Assessment Tool (RoB 2) for randomized controlled trials (RCTs). The RoB 2 tool covers five domains: the randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selective reporting of results. For non-randomized studies of interventions (NRSIs), the ROBINS-I tool will be used to assess the risk of bias. In addition, the STRICTA (Standards for Reporting Interventions in Clinical Trials of Acupuncture) checklist will be used to assess the reporting quality of acupuncture interventions.

Two independent reviewers (Linglin Dai and Yin Zhang) will each evaluate the included studies and reach conclusions of "low risk," "high risk," or "some concerns." After the independent assessments, a consistency check will be conducted. Any disagreements will be resolved through discussion with a third author (Lili Wang).

Strategy of data synthesis Data synthesis will be performed using a combination of data-mining methods:

(1) Descriptive statistics: The frequency of acupoint use, body regions, meridians, and specific acupoint attributes will be analyzed using WPS Spreadsheets (version 12.1.0.26375).

(2) High-frequency acupoints: Identified according to Price's law ($M = 0.749 \times (P_{\max})^{1/2}$). If more than 50 high-frequency acupoints are identified, a secondary criterion (average frequency) will be applied.

(3) Association rule analysis: Conducted in SPSS Modeler 14.1 using the Apriori algorithm. The minimum support and confidence thresholds will be determined by a prespecified, objective procedure (candidate thresholds: support 5%–20%, confidence 50%–90%), with the final thresholds selected as the lowest values at which the number of generated rules reaches a stable plateau. Sensitivity analyses will be performed.

(4) Exploratory factor analysis: Conducted in SPSS Statistics 26.0, with a minimum subject-to-item ratio of 5:1 and at least 100 prescriptions.

(5) Cluster analysis: Conducted in SPSS Statistics 26.0, with stability assessed by bootstrap resampling (1,000 replications); only clusters appearing in >70% of resamples will be considered stable.

(6) Decision tree analysis: Conducted in SPSS Statistics 26.0 using the CHAID algorithm. The target variable is the presence of a core acupoint combination (1 = present, 0 = absent). Model stability will be evaluated by 10-fold cross-validation, with mean accuracy and standard deviation reported.

Subgroup analysis No subgroup analysis is planned. This is a data-mining study of published acupoint prescriptions, and the primary objective is to identify overall patterns of acupoint selection and combinations in acupuncture treatment for endometriosis. Subgroup analyses based on clinical characteristics (e.g., disease stage, symptom type, or acupuncture technique) are beyond the scope of this protocol and may be explored in future studies.

Sensitivity analysis Sensitivity analyses will be performed for the association rule analysis. The minimum support and confidence thresholds will be tested across a range of candidate values (support: 5%–20%; confidence: 50%–90%), and the robustness of the identified association rules will be assessed by comparing the results obtained under different threshold combinations. If the core acupoint combinations remain stable across these settings, the findings will be considered robust.

Language restriction Yes. Only literature published in Chinese or English will be included. Literature in other languages will be excluded.

Country(ies) involved China. All authors are affiliated with institutions in Hangzhou, Zhejiang Province, China.

Other relevant information This is a protocol for a data-mining study of published clinical literature. It does not involve patient recruitment, clinical intervention, or collection of primary data; therefore, ethical approval is not required. The study will be conducted in accordance with the PRISMA 2020 statement.

Keywords acupuncture; endometriosis; data mining; acupoint selection and combination protocols; research protocols.

Dissemination plans The findings of this study will be submitted for publication in a peer-reviewed journal. The results may also be presented at academic conferences and shared with clinicians and researchers in the field of acupuncture and gynecology.

Contributions of each author

Author 1 - Linglin Dai - Contributed to the conception and design of the study, the development of the selection criteria, and the risk of bias assessment strategy. This author conducted the literature search and screening, data extraction and normalization, and data analysis, and drafted the manuscript.

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Author 2 - Yin Zhang - Contributed to the conception and design of the study, the development of the selection criteria, and the risk of bias assessment strategy. This author independently performed literature screening and quality assessment, contributed to data extraction and normalization, and revised the manuscript.

Author 3 - Lili Wang - contributed to the conception and design of the study, and to the development of the selection criteria and the risk of bias assessment strategy. This author resolved disagreements during literature screening and quality assessment, and revised the manuscript.