

INPLASY PROTOCOL

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Conflicts of interest:
This study has obtained the
consent of all authors, and
there is no conflict of interest.

Comparative efficacy of acupuncture and related therapies for migraine: a systematic review and network meta-analysis

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Review question / Objective: Migraine is a worldwide disabling chronic brain disorder, and some studies suggest acupuncture and related therapies play an important role in raising efficiency rates and reducing migraine attacks. However, clinical trials comparing the efficacy of different interventions for migraine are limited and controversial. This network meta-analysis (NMA) was performed to compare the effectiveness of different acupuncture and related therapies for migraine. **Methods.** Randomized controlled trials (RCTs) of acupuncture and related therapies for migraine were searched in the following databases from the date of database inception to July 30, 2019, including PubMed, Embase, Cochrane Library, Web of Science, CNKI, Sinomed, Wanfang, Vip. The Visual Analog Scale (VAS scores), frequency of migraine attacks, duration of migraine, days with migraine were used to describe efficacy. The network meta-analysis was performed using STATA 14.0, WinBUGS 1.4.3 and Review Manager 5.3. **Results.** Thirty-three RCTs were included, which contained 3922 participants among 15 interventions. Based on decreases in VAS scores.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 January 2021 and was last updated on 12 January 2021 (registration number INPLASY202110035).

INTRODUCTION

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comparing the efficacy of different interventions for migraine are limited and controversial. This network meta-analysis (NMA) was performed to compare the effectiveness of different acupuncture and related therapies for migraine. **Methods.** Randomized controlled trials (RCTs) of acupuncture and related therapies for migraine were searched in the following databases from the date of database inception to July 30, 2019, including PubMed, Embase, Cochrane Library, Web of Science, CNKI, Sinomed, Wanfang, Vip. The Visual Analog Scale (VAS scores), frequency of migraine attacks, duration of migraine, days with migraine were used to describe efficacy. The network meta-analysis was performed using STATA 14.0, WinBUGS 1.4.3 and Review Manager 5.3. **Results.** Thirty-three RCTs were included, which contained 3922 participants among 15 interventions. Based on decreases in VAS scores.

Condition being studied: The researcher has a good research foundation, has presided over and participated in a number of National Natural Science Foundation projects, 973 projects, and provincial major projects, and has a good experimental foundation and conditions.

METHODS

Participant or population: Migraine patients.

Intervention: Acupuncture.

Comparator: Related therapies for migraine.

Study designs to be included: The present analysis was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Network Meta-Analysis (PRISMA-NMA) checklist.

Eligibility criteria: Inclusion Criteria. For the network meta-analysis, studies that met the following criteria were included: (1)Types of study: studies must be designed as randomized controlled trials (RCTs) acupuncture for migraine, and standard-

compliant studies have no language-wide restrictions;(2)Types of patients: patients were diagnosed as migraine with aura, without aura or other special types and there were no limitations to sex, age and the course of the disease, but the diagnostic criteria, the criteria of inclusion and exclusion must be clear;(3)Types of interventions: patients received acupuncture and related therapies (includes acupuncture, embedding needle therapy, acupressure, electroacupuncture, etc; acupuncture and massage, acupuncture and cupping, etc) in the experimental group, placebo and analgesic were employed in the control group; (4)Types of outcomes: one of the following efficacy outcomes and safety endpoints must be reported, including VAS scores, frequency of migraine attacks, duration of migraine, days with migraine and adverse events. **Exclusion Criteria.** The following were excluded:(1)duplicate studies; (2)non-randomized controlled trials(RCTs); (3)literature review, animal experiments, conference papers, case reports, systematic reviews and meta-analyses; (4)studies with unclear results or inconsistent outcomes; (5)the patient's migraine was caused by organic disease such as cerebral hemorrhage, cerebral thrombosis, hypertension, arteriosclerosis. Have a good research foundation and meet the qualification standards.

Information sources: We performed a comprehensive and systematic search from initiation until July 30, 2019 based on the databases of PubMed/Medline, Embase, Cochrane Library, Web of Science, CNKI, Sinomed, Wanfang, Vip to identify eligible randomized controlled trials(RCTs), without any restriction on language. The following keywords combined with Medical Subject Headings (MeSH) terms were used for searching: “acupuncture” “acupuncture Therapy” “acupuncture analgesia” “migraine” “disorder, migraine” “randomized controlled trial” and “random allocation”.

Main outcome(s): Based on decreases in VAS scores, results from network meta-analysis (NMA) of the direct and indirect

comparisons showed that acupuncture (standard mean difference (SMD): 1.14; 95% credible interval (95%CI), 0.44 to 1.86), auricular acupuncture (SMD: -1.38; 95%CI, 2.47 to -0.19), acupuncture+cupping (SMD: -2.67; 95%CI, -4.96 to -0.49), acupoint injection (SMD: -3.98; 95%CI, -5.56 to -2.43), acupoint implantation (SMD: -2.66; 95%CI, -5.03 to -0.30) were superior than placebo in efficacy. As for the frequency of migraine attacks, the NMA results showed that acupuncture (SMD: 1.21; 95%CI, 0.19 to 2.25), acupoint injection (SMD: -4.14; (95%CI, -6.48 to -1.90) were more effective than placebo. In addition to the above results, embedding needle therapy (SMD: -25.07; 95%CI, -50.18 to -6.79) had a significant advantage over placebo in decreasing the duration of migraine.

Quality assessment / Risk of bias analysis:

Two investigators (LJ and YJ) used the Cochrane Collaboration Tool to independently assessed the risk of bias in the included RCTs[24]. The following six aspects were evaluated: (1) random sequence generation; (2) allocation concealment; (3) blinding of participants and personnel; (4) blinding of outcome assessment; (5) incomplete outcome data; (6) selective reporting. The judgments of the above projects were classified into “high risk”, “low risk” or “unclear risk”. If there was any disagreement, it would be decided by the third reviewer. Disagreements would be decided by the third reviewer (HJ).

Strategy of data synthesis: First of all, meta-analysis and statistical analysis were performed by using Review Manager (Version 5.3, Cochrane Collaboration, Oxford, UK). The heterogeneity between RCTs would be determined by the calculation of I-square (I²), which meant that the random effects model should be selected for analysis When I² > 50%, and the fixed effect model was selected if I² < 50%. The continuous data in this paper were analyzed using the mean difference (MD) of the 95% confidence intervals (CI), subgroup analysis could be done based on country or acupuncture category if necessary. Then a forest map was

generated to show the relative efficacy of each group of interventions. Next, network meta-analysis was performed in the Bayesian framework by using WinBUGS (version 1.4.3, MRC Biostatistics Unit, Cambridge, UK) to indirectly compare the efficacy of acupuncture and related therapies. The specific operation details were as follows: the calculation of the model was mainly carried out by employing four chains with over-dispersed initial values in the Markov chain Monte Carlo (MCMC) simulation method. Taking into account the factors that arbitrary value was affected, the Markov chain would be used for 50,000 simultaneous iterations after abandoning the first 20,000 iterations. Moreover, the Brooks-Gelman-Rubin (BGR) method was mainly to assess the model's convergence, and the criterion was that the closer the potential scale reduction factor (PSRF) value was to 1, the better convergence. At last, we performed a meta-analysis of the STATA software (Version 14.0; Stata Corporation, College Station, Texas, USA), which continuous outcomes were analyzed by utilizing the mean difference (MD) and its 95% confidence intervals (CI), then network graphs were created by using the "mvmeta" command in STATA to describe the type of acupuncture and related therapies in the comparison network. Additionally, based on the network meta-analysis, the surface.

Subgroup analysis: Subgroup analysis could be done based on country or acupuncture category if necessary.

Country(ies) involved: China.

Keywords: Migraine; Acupuncture; Network meta-analysis.

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