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Immediate analgesic effect of acupuncture intervention within 10 minutes during acute migraine attacks: protocol of a randomised controlled trial

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ABSTRACT

Introduction Migraine is a widespread neurological disorder characterised by recurrent moderate to severe headaches. These headaches can seriously

affect patients' daily life and work, especially during acute attacks when patients often need immediate pain relief. This study aims to assess the immediate analgesic effect of acupuncture for 10 minutes during acute migraine attacks.

Methods and analysis The study will randomly divide 80 participants into either the Acupuncture group or the Sham acupuncture group with an allocation ratio of 1:1. Each group will receive 10 minutes of treatment, and the post-treatment evaluation will be performed after 0, 0-2, 4, 6, 8, and 10 minutes of acupuncture. The primary outcome is the effective rate after 10 minutes of acupuncture. Additionally, secondary outcomes include the effective rate and visual analogue scale (VAS) scores of headache attack intensity at 0, 0-2, 4, 6, 8, and 10 minutes after acupuncture. Data will be collected at baseline time (pre-treatment) and the end of treatment (after 10 minutes). Adverse events during each treatment period will be collected and recorded.

Ethics and dissemination Ethics approval was obtained from the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine (2022-008). All participants will provide written informed consent before randomisation. The results of this study will be published in a peer-reviewed journal and presented at conferences.

Trial registration number Chinese Clinical Trial Registration Center (ChiCTR2200066976).

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒This study is the first randomized controlled study to evaluate the immediate analgesia efficacy of acupuncture for acute migraine attacks.

⇒The results of this study will provide reliable clinical evidence for the use of acupuncture in the treatment of acute migraine attacks.

⇒No positive drug control group is set up in the study.

⇒No follow-up is set for this study.

⇒This study is not a multicenter study.

INTRODUCTION

Migraine is a widespread neurological disorder characterized by moderate to severe throbbing headache, often accompanied by photophobia, phonophobia, nausea, and vomiting, which can seriously affect patients' daily life and work during acute attacks.[1] Among them, migraine without aura (MwoA) is the most common type of migraine, accounting for about 80% of migraine.[2] Studies have shown that the incidence of migraine in the acute phase is 17.4% in women and 5.7% in men, and the incidence of women is about 2-3 times higher than that of men.[3 4] In addition, the disability-adjusted life years (DALYs) and the economic burden of migraine are increasing year by year.

At present, western medicine is mainly used for pain relief in the acute phase of migraine with non-specific therapeutic drugs (non-steroidal anti-inflammatory drugs) and specific therapeutic drugs (triptans and ergot drugs), which have significant clinical treatment effects, but long-term use has drug resistance and certain side effects.[5] Acupuncture, as a safe and effective non-pharmacological treatment, is gaining increasing interest. Studies have shown that acupuncture is more effective in the treatment of migraine without aura than sham acupuncture and conventional treatment, that it significantly reduces the frequency of migraine attacks, and that it has a faster onset of action compared to oral medication.[6 7] However, migraine is a chronic disease, which is difficult to completely cure, and requires long-term maintenance treatment. Patients in the acute attack stage urgently need immediate pain relief. Studies have also shown that acupuncture is superior in relieving acute pain.[8] Our team has shown in a previous study that acupuncture is effective for immediate analgesia in acute migraine attacks, but with limitations such as a small sample size and no control group.[9] Further research is needed to support the immediate analgesic effect of acupuncture in migraine.

Objectives

This study aims to evaluate the immediate analgesic effect of acupuncture for acute migraine attacks.

METHODS AND ANALYSES

The study protocol was designed in accordance with standard protocol project design: Recommendations in the Guidelines for Interventional Trials[10] (Supplementary **file 1** online). The study protocol was approved by the Medical Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine (2022-2023).

Patient and public involvement

No patient involved.

Study design and setting

This randomised and sham-controlled clinical trial was designed to evaluate the efficacy of acupuncture for acute migraine attacks. This study will be conducted in the Second Affiliated Hospital of Yunnan University of Chinese Medicine. Eighty patients with migraine will be recruited. The duration of the study is 10 minutes, including at baseline, 0-2 minutes (during treatment), 4 minutes (during treatment), 6 minutes (during treatment), 8 minutes (during treatment), and 10 minutes (at the end of treatment). Each group will receive 10 minutes of treatment, a total of 1 treatment. The flow chart of the study procedure is shown in **Figure 1.** Patient enrollment, intervention, and assessment schedules are shown in **Table 1.**

Table 1 Study schedule for data measurements

	STUDY PERIOD

	Baseline period (minutes)	Treatment period (minutes)				
TIMEPOINT	0	0-2	4	6	8	10
ENROLMENT:						
Eligibility screen	×					
Sign informed consent	×					
Inclusion/exclusion criteria	×					
Physical examination	×					
Randomisation	×					
INTERVENTIONS:						
Acupuncture group		×	×	×	×	×
Sham acupuncture group		×	×	×	×	×
ASSESSMENTS:						
Basic situation of headache	×					×
VAS	×	×	×	×	×	×
Satisfaction evaluation						×
Adverse event		×	×	×	×	×
Compliance evaluation						×
Blind evaluation						×
Safety evaluation						×
PARTICIPANTS SAFETY						
AE						×

Abbreviations: VAS, visual analog scale; AE, adverse events.

Recruitment and informed consent

All participants will be recruited from the Second Affiliated Hospital of Yunnan University of Chinese Medicine and Kunming communities. A public recruitment advertisement for this trial will be designed to recruit the patients online or offline (e.g. WeChat public account, websites). Neurologists will determine whether patients are eligible to participate in this study based strictly on inclusion and exclusion criteria. If patients who are interested and volunteer to participate in this trial meet the inclusion criteria, they will sign written informed consent before the start of the study. They will be fully informed of the research information including the study procedures, benefits, and potential risks, except for the information about the needling site. They are free to

withdraw from the study without penalty at any time and without any negative impact on their future medical treatment.

Study population

Inclusion criteria

Participants who meet all of the following requirements will be considered for inclusion: (1) meet the diagnostic criteria for migraine without aura in the International Classification of Headache Disorders ICHD-3 designated by the International Headache Society (IHS) in 2018; (2) unilateral migraine, male or female, aged between 18 and 60 years; (3) patients who are experiencing acute migraine attacks; (4) the severity of headache is moderate to severe (VAS 4-9); (5) volunteer to participate and sign the informed consent.

Excluded criteria

Patients will be excluded if they have (1) patients with bilateral or alternating unilateral migraine; (2) any history of head trauma, headache of other types or unknown diagnosis, or cervical headache; (3) complicated with cardiovascular and cerebrovascular, liver, kidney, hematopoietic system and other serious primary diseases and other organic diseases; (4) severe anxiety, depression, insomnia and other mental diseases or intellectual disabilities, unable to cooperate with the questionnaire, or infection, bleeding disorders, allergies, skin diseases; (5) patients who have already taken analgesics since the current migraine attack; (6) pregnant or lactating patients; (7) participating in other similar studies.

Removed criteria

(1) All cases that do not meet the inclusion criteria and are mistakenly included should be eliminated; (2) patients whose trials are terminated due to serious adverse events or complications that made it inappropriate to continue treatment.

Randomisation and blinding

The participants will be randomised in a ratio of 1:1 to the Acupuncture group, and the Sham acupuncture group. To avoid selection bias, random numbers will be generated by an independent research assistant using a computer and sealed in opaque envelopes. After participants accept the principle of random allocation, they will randomly conduct to select an opaque envelope and obtain an allocation sequence number, which will be recorded into a case report form (CRF) by a specially assigned person. The participants, researchers, outcome assessors, and statisticians will be blinded to the group allocation throughout the study. Because of the particularity of the sham acupuncture technique, acupuncturists could not be blinded.

Intervention

The intervention measures will be in accordance with the Uniform Standard for Trial Reporting[11] and the Standard for Reporting Interventions in Clinical Trials of Acupuncture and Moxibustion.[12] According to clinical experience, previous research, and TCM theory (most migraine is Shaoyang meridian headache), shu points and specific acupoints of Shaoyang meridian will be selected as prescriptions. Among them, TE3 (Zhongzhu), TE5 (Waiguan), GB41 (Zulinqi), GB34 (Yanglingquan), GB20 (Fengchi), and GB8 (Shuaigu).[6] All acupoints will be located according to the 2010 World Health Organization standard (ISBN: Tel: 9787117123327). The acupoint locations are shown in **Table 2** and **Figure 2.**

Table 2 Location of acupoints

Acupoints	Location
TE3 (Zhongzhu)	On the dorsum of the band, between the fourth and fifth metacarpal bones, in the depression proximal to the fourth metacarpophalangeal joint.
TE5 (Waiguan)	On the posterior aspect of the forearm, midpoint of the interosseous space between the radius and the ulna, 2 B-cun

	proximal to the dorsal wrist crease.
GB41 (Zulinqi)	On the dorsum of the foot, distal to the junction of the bases of the fourth and fifth metatarsal bones, in the depression lateral to the fifth extensor digitorum longus tendon.
GB34 (Yanglingquan)	On the fibular aspect of the leg, in the depression anterior and distal to the head of the fibula.
GB20 (Fengchi)	In the anterior region of the neck, inferior to the occipital bone, in the depression between the origins of sternocleidomastoid and the trapezius muscles.
GB8 (Shuaigu)	On the head, directly superior to the auricular apex,1.5 B-cun superior to the temporal hairline.

Appliance selection

(1) Park Sham Acupuncture Device (PSD) (see **Figure 3A**): includes transparent guide tube (Φ4x20mm, Φx35mm), double-sided tape (Φ1x15mm), and the opaque plastic base (Φ4x15mm, Φ5x10mm), Suzhou Medical Supplies Factory Ltd, lot no.9018390000, China.

(2) Acupuncture needle: use the Huatuo brand disposable acupuncture needles produced by Suzhou Medical Supplies Factory Ltd, China. Manufacturer's license number: Su Food and Drug Administration of Machinery Production 20010020; Registration certificate number: 201622770970. specifications of acupuncture are 0.30x(25mm, 40mm).

(3) Blunt needle: use retractable stainless steel blunt needle (0.25x25mm, 0.25x40mm), Suzhou Medical Supplies Factory Ltd, lot number: 9018390000, China.

Operation

Manipulation Prior to the acupuncture procedure, participants will be placed in a prone position while the acupuncturist routinely sterilized the skin around the acupoints. All two groups will use the PSD.

Acupuncture group:

PSD+acupuncture needle will be used. After removing the skin side of the base of the PSD double-sided tape, and then import the disposable

acupuncture needle, exposing the tip of the needle, it will be fixed on the acupuncture point and pierced into the skin, and the twisting, lifting and inserting, flat complementary and flat diarrhea techniques will be performed to achieve the needling sensation occurs.

Sham acupuncture group:

PSD+blunt needle will be used. After removing the skin-facing double-sided tape on the base, a retractable blunt needle will be introduced, and the blunt needle tip will retract back into the hollow needle handle by force when it touches the skin and will not pierce the skin, but the participants will feel the sensation of needle prick. The acupoints on the extremities will be glued to the skin by means of double-sided tape on the base, and on the head, which is affected by the hair, we will use hairpins to fix them (see **Figure 3B**).

The duration of needle retention for both groups will be 10 minutes per session. Following the treatment, patients will be advised to take analgesic medication or seek other forms of pain relief if their headache persists, based on their condition. The treatment will be performed by a single acupuncturist with more than 3 years of clinical experience.

Emergency treatment

During treatment, if the patient's headache remains unrelieved or even worsens during treatment to the extent that it is unbearable, we will discontinue the trial immediately and initiate emergency treatment. This can include emergency analgesics such as NSAIDs and transporting the patient to the emergency department as advised by the emergency physician for further management. Additionally, If patients in the sham acupuncture group do not experience relief, they will receive acupuncture treatment or other emergency treatment.

Outcomes

Primary outcome

The primary outcome is effective analgesia rate after 10 minutes of acupuncture treatment. Effective analgesia is defined as the proportion of subjects who experience a reduction of at least 50% in their VAS pain score compared to the baseline measurement.

Secondary outcomes

The secondary outcomes include analgesic efficiency at various time points (0, 0-2, 4, 6, 8 minutes), visual analog scale (VAS) score, and blinding assessment. The VAS will be assessed seven times in total, including at baseline, 0-2 minutes (during treatment), 4 minutes (during treatment), 6 minutes (during treatment), 8 minutes (during treatment), and 10 minutes (at the end of treatment). The VAS is an assessment tool in which patients indicate their level of pain on a continuous line of 10 cm, ranging from no pain to the worst possible pain; Higher scores on the VAS indicate a more severe pain experience. The scale of the VAS of pain is shown in Supplementary **file 2.**

Sample size

According to previous research, acupuncture is 66% effective in treating moderate to severe acute migraine,[9] Studies on acupuncture and migraine have shown a 31% difference in efficacy between true and false acupuncture.[13] We anticipate that the efficiency of the acupuncture group and the sham acupuncture group in treating migraine for 10min was estimated to be 60% and 30%, respectively. The ratio between the acupuncture group and the sham acupuncture group was 1:1, the bilateral significance level was 0.05, and the test efficacy was 90%. According to the formula, it was estimated that at least 72 patients were needed, and a loss rate of 10% was considered. It was calculated that 40 patients in each group should be included, a total of 80 cases.

Statistical analysis

The statistical analyses will be performed using SPSS software (SPSS V25.0 for Windows). Qualitative data will be described by percentages or proportions, and quantitative data will be expressed as mean ± standard deviation. Independent t-test or Mann-Whitney U-test and χ^2-test or Fisher's exact test will be applied for the analysis of continuous and categorical variables, respectively. To assess baseline characteristics and the documentation of primary and secondary outcomes, the intention-to-treat (ITT) principle will be applied. The significance level will be set at 0.05 using a two-sided test.

Patient and public involvement

Patients and the public will not be involved in the planning or design of the study. They will not be involved in the recruitment, conduct, or report of the study. The study results will be disseminated to the participants and public in the forms of educational talks and booklets or flyers and published in open access peer-reviewed journals.

Trial status

The trial will begin recruitment and treatment on June 1, 2023, and is expected to be completed by June 30, 2025.

Data management and confidentiality

Each participant's CRF will be completed in a timely and carefully manner by the investigator. The data collector is responsible for keeping and managing various data and rigorously proofreading the data, and the research director will regularly check the authenticity of the data collection. Personal information of all participants, such as name, phone number, medical records, etc. will be kept anonymously to prevent information leakage. The data of all participants will be kept by the researchers in a special cabinet and will be kept for at least 5 years after publication. The Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine will regularly review the

progress of the trial and supervise the collection, allocation, and concealment of data. Modifications or termination of the trial could be performed by the committee. The data monitoring committee was independent of the sponsors and had no conflicts of interest.

Adverse events reporting and safety monitoring

During the study period, participants may suffer from AE, such as dizzy with needles and headache aggravated rather than alleviated, which will be given timely and proper treatment, carefully recorded in the CRF, and reported to the study leader and the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Traditional Chinese Medicine. All AEs will be compared between groups using the χ^2 test or Fisher's exact test.

Ethics and dissemination

This study was approved by the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine on October 6, 2022 (2022-008), and conformed to the Declaration of Helsinki. All participants must provide written informed consent before participating in the trial. Data handling will be done anonymously, and only the participant code available in the central database. All personal information on potential and enrolled participants out of the scope of this trial will not be collected, shared, or maintained to protect confidentiality before, during, and after the trial. The results of this study will be published in a peer-reviewed journal and presented at conferences.

DISCUSSION

Migraine is a chronic disease that is difficult to cure completely and requires long-term maintenance treatment. Patients in the acute phase of the attack desperately need immediate pain relief. Studies have shown that acupuncture

can inhibit sympathetic nerve function in migraine patients, reduce the number and frequency of headache attacks, and also show obvious advantages in rapid analgesia.[14] Therefore, the results of this study may provide credible clinical evidence for the effectiveness of acupuncture in the treatment of acute migraine.

Migraine is often unilateral and classified as Shaoyang headaches in traditional Chinese medicine. Therefore, acupoint prescriptions usually target pain relief points situated along the Shaoyang Meridian.[9] Research reveals that acupuncture can inhibit sympathetic nerve function in migraine patients and decrease the frequency and number of headache attacks.[15] In addition, as a kind of acupuncture, the action mechanism of contralateral acupuncture (CAT) is related to the central nervous system. Studies demonstrate that CAT is vital in relying on the brainstem, cerebral cortex, and reticular structures within the central nervous system. By leveraging these important structural foundations, acupuncture signals are diffused and propagated bilaterally and extensively up to the brainstem level, proving beneficial in treating various pain-related illnesses.[16] CAT, a classical traditional Chinese acupuncture technique, refers to the method of taking acupoints on the healthy side. In China, the CAT is widely used in pain diseases caused by various reasons and has demonstrated favorable clinical efficacy.[17 18] Some studies have shown that CAT has better efficacy than ipsilateral acupuncture (IAT).[19 20]

In addition, migraines often occur unilaterally, with pain sites distributed to the left and right. The pathological mechanism study has found that migraine also has the phenomenon of left and right shunt of vascular distribution,[21] the difference of functional response between the left and right central hemisphere,[22] and the asymmetry of pain-related substances (dimethylarginine, etc.).[23] Consequently, the inclusion criteria for this study focus primarily on unilateral migraines. The study also found that acupuncture on the healthy side could awaken the circumflex area, indicating that unilateral acupuncture can stimulate the contralateral area at the same time, providing

some objective support for the treatment of painful diseases.[24] Therefore, it is feasible to validate the efficacy of CAT in patients with unilateral migraine.

Some studies have shown that sham acupuncture produces greater treatment effects than drugs containing a placebo.[25] In this study, we utilized the blunt non-penetrating needle as the control group to reduce any bias caused by opening the blind.[26 27] During the acupuncture procedure, the blunt needle was touched to the skin surface as much as possible, so that the patient had a slight tingling sensation, so as to reduce the difference in needling sensation and effectively avoid the occurrence of blind bias. Previous investigations on acute pain acupuncture therapy have observed treatment effects within 15 to 30 minutes.[28 29] To achieve optimal treatment effects in a shorter time frame, we based our study design on our previous research, which found that acupuncture can provide relief for migraine within 10 minutes.[9] Thus, the observation time in this study is 10 minutes.

In addition, this study is the first randomized controlled study to evaluate the immediate analgesia efficacy of acupuncture for acute migraine attacks, and the findings will provide clinical evidence for acupuncture in the treatment of acute migraine attacks. This study can be seen in light of some limitations. First, it should be noted that this is a single-center study. While there may be potential biases compared to a multi-center study, the quality of a single-center study can be more easily controlled to ensure more accurate results. Second, there is no positive drug control group was set up in this study. Third, the acupuncturist was not blinded to the group allocation, which could potentially introduce some subjective bias and impact the trial's outcomes.

In summary, immediate analgesia is a major need for migraine patients during acute attacks. Acupuncture has been considered as a better option for immediate headache relief. However, there is a lack of sufficient clinical evidence to support this. This study aims to evaluate the immediate analgesic effect of acupuncture in the treatment of acute migraine attacks, and the

findings will provide reliable evidence for the application of acupuncture in acute migraine attacks.

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Contributors Y-H and Q-FL contributed equally to this work and are co-first authors. T-PG and F-RL are co-corresponding authors. T-PG, Y-H, Q-FL, and F-RL contributed to the protocol design and writing of the manuscript. G-YZH is responsible for the design of randomisation. X-MP, X-T, and R-RZ are responsible for data entry. S-WZ and Z-LL are responsible for acupuncture treatment. Z-WC and J-BS are responsible for guidance and statistics. All authors approved the final manuscript.

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Competing interests None declared.

Provenance and peer review Not commissioned; externally peer-reviewed.

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Figure legends

Figure 1 Flowchart of the research procedure

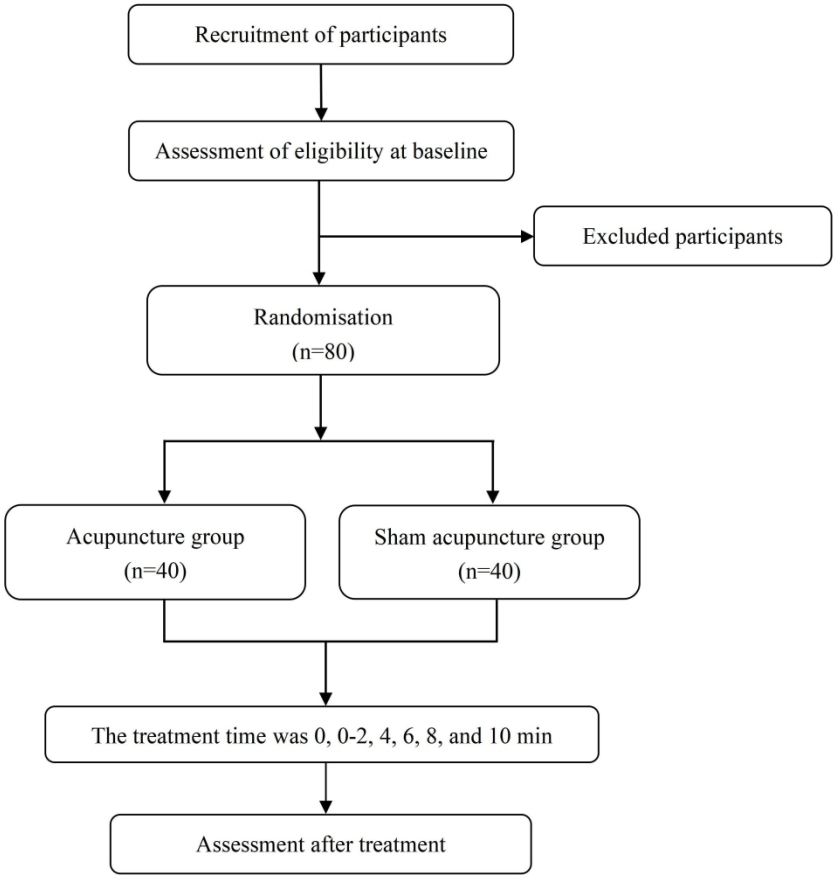
Figure 2 Location of acupoints

Figure 3 A: Park Sham Acupuncture Device; **B:** Retaining needle

Supplemental files

file 1 SPIRIT_Fillable-checklist-15-Aug-2013

file 2 The Visual Analogue Scale of Pain



Flowchart of the research procedure

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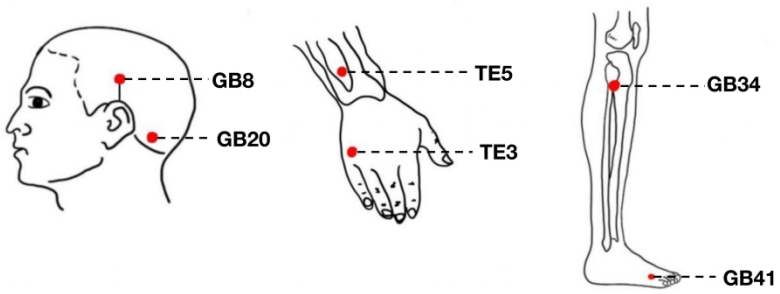
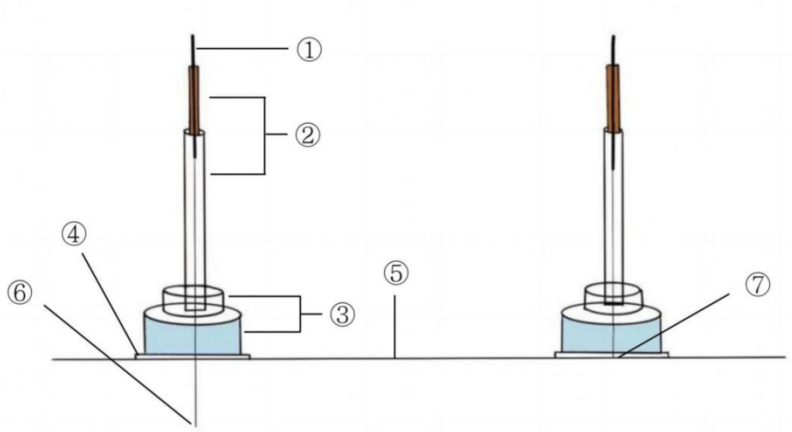


Location of acupoints

354x171mm (300 x 300 DPI)

A



① Needle handle; ②Transparent guide tude; ③Opaque plastic base; ④Double-side tape; ⑤Skin; ⑥Sharp tip; ⑦Blunt tip

B

Hairpins to hold hair and needle

Park sham acupuncture device

A: Park Sham Acupuncture Device; B: Retaining needle

Park Sham Acupuncture Device

508x604mm (168 x 168 DPI)

SPIRIT

STANDARD PROTOCOL ITEMS: RECOMMENDATIONS FOR INTERVENTIONAL TRIALS

SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Addressed on page number
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	2
	2b	All items from the World Health Organization Trial Registration Data Set	N
Protocol version	3	Date and version identifier	2
Funding	4	Sources and types of financial, material, and other support	14
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	1
	5b	Name and contact information for the trial sponsor	14
	5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	14
	5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	14

Introduction			
Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	2
	6b	Explanation for choice of comparators	3
Objectives	7	Specific objectives or hypotheses	3
Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	4
Methods: Participants, interventions, and outcomes			
Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	5
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	5
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	7
	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	7
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	7
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	7
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	9
Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	9

Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	9
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	5
Methods: Assignment of interventions (for controlled trials)			
Allocation:			
Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	10
Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	10
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	10
Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	10
	17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	10
Methods: Data collection, management, and analysis			
Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	10
	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	11

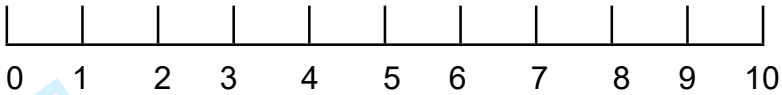
Data management	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	10
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	10
	20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	N
	20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	10
Methods: Monitoring			
Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	10
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	11
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	11
Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	11
Ethics and dissemination			
Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	2
Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	14

Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	14
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	N
Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	10
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	14
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	14
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	14
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	15
	31b	Authorship eligibility guidelines and any intended use of professional writers	15
	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	N
Appendices			
Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	5
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	N

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons "Attribution-NonCommercial-NoDerivs 3.0 Unported" license.

Visual analo scale (VAS)

Use a 10cm VAS scale with a moving scale between 0 and 10 on the front and a number from 0 to 10 on the back, with 0 being no pain and 10 being the most painful. Please state your pain level according to the following scale.



VAS scale (0-10 scores)

0: no pain; 1-3: light pain; 4-6: moderate pain; 7-10:severe and unbearable pain.

Projects		Before treatment	Treatment				
		0min	0-2min	4min	6min	8min	10min
VAS score							
Accompanying symptoms (0 None. 1 mild; 2 moderate; 3 severe）	nausea						
	vomit						
	photophobia						
	Fear of noise						
	other						

BMJ Open

Immediate analgesic effect of acupuncture intervention within 10 minutes during acute migraine attacks: protocol of a randomised controlled trial

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Primary Subject Heading:	Complementary medicine
Secondary Subject Heading:	Global health
Keywords:	Pain management < ANAESTHETICS, COMPLEMENTARY MEDICINE, Migraine < NEUROLOGY

Immediate analgesic effect of acupuncture intervention within 10 minutes during acute migraine attacks: protocol of a randomised controlled trial

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ABSTRACT

Introduction Migraine is a widespread neurological disorder characterised by recurrent moderate to severe headaches. These headaches can seriously

affect patients' daily life and work, especially during acute attacks when patients often need immediate pain relief. This study aims to assess the immediate analgesic effect of acupuncture for 10 minutes during acute migraine attacks.

Methods and analysis The study will randomly divide 80 participants into either the Acupuncture group or the Sham acupuncture group with an allocation ratio of 1:1. Each group will receive 10 minutes of treatment, and the post-treatment evaluation will be performed after 0, 0-2, 4, 6, 8, and 10 minutes of acupuncture. The primary outcome is the pain visual analogue scale (VAS) score assessed before and after treatment at 10 min. Additionally, secondary outcomes include the pain VAS score assessed at 0-2, 4, 6, and 8 min, blinding assessment and treatment effectiveness expectations scale. Data will be collected at baseline time and the end of treatment (after 10 minutes). Adverse events during each treatment period will be collected and recorded.

Ethics and dissemination Ethics approval was obtained from the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine (2022-008). All participants will provide written informed consent before randomisation. The results of this study will be published in a peer-reviewed journal and presented at conferences.

Trial registration number Chinese Clinical Trial Registration Center (ChiCTR2200066976).

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒This study is the first randomized controlled study to evaluate the immediate analgesia efficacy of acupuncture for acute migraine attacks.

⇒The results of this study will provide reliable clinical evidence for the use of acupuncture in the treatment of acute migraine attacks.

⇒No positive drug control group is set up in the study.

⇒No follow-up is set for this study.

⇒This study is not a multicenter study.

INTRODUCTION

Migraine is a widespread neurological disorder characterized by moderate to severe throbbing headache, often accompanied by photophobia, phonophobia, nausea, and vomiting, which can seriously affect patients' daily life and work during acute attacks[1]..Among them, migraine without aura (MwoA) is the most common type of migraine, accounting for about 80% of migraine[2]. Studies have shown that the incidence of migraine in the acute phase is 17.4% in women and 5.7% in men, and the incidence of women is about 2-3 times higher than that of men[3,4]. In addition, the disability-adjusted life years (DALYs) and the economic burden of migraine are increasing year by year. At present, migraine remains the second leading cause of disability in the world and ranks first among young women[5]. According to the Global Burden of Disease Report 2019, migraine accounts for 88.2% of the burden of disease for headache and causes approximately 42.1 million years of disability years of life lost (YLDs) per year, and 4.8% of total YLDs[6]. There have been more than 1 billion cases of migraine worldwide, with an annual prevalence as high as 15%, with the highest prevalence in European countries at 35%, in the United States at 12-13%, and in East Asian countries at 25-35%[7]. And in China, the prevalence is relatively low at 9.3%, but the absolute number of cases is still large due to the large population base[8].

At present, western medicine is mainly used for pain relief in the acute phase of migraine with non-specific therapeutic drugs (non-steroidal anti-inflammatory drugs) and specific therapeutic drugs (triptans and ergot drugs), which have significant clinical treatment effects, but long-term use has drug resistance and certain side effects[9]. Acupuncture, as a safe and effective non-pharmacological treatment, is gaining increasing interest. Studies have shown that acupuncture is more effective in the treatment of migraine without aura than sham acupuncture and conventional treatment, that

it significantly reduces the frequency of migraine attacks, and that it has a faster onset of action compared to oral medication[10]. Acupuncture shows a promising trend in effectively reducing the frequency of migraine attacks. One study in comparing the efficacy of acupuncture with sham acupuncture and waiting for treatment of migraine found that the acupuncture group significantly reduced the frequency of migraine attacks, with a mean reduction in the frequency of attacks of 3.2 (2.1)[11]. Another study has demonstrated that the frequency would be reduced to 3.5 days in the acupuncture group relative to the sham and preventive medicine groups[12]. These results indicate that acupuncture has the potential to be an effective method of controlling the frequent occurrence of migraine attacks.

However, migraine is a chronic disease, which is difficult to completely cure, and requires long-term maintenance treatment. Patients in the acute attack stage urgently need immediate pain relief. Studies have also shown that acupuncture is superior in relieving acute pain[13]. Our team has shown in a previous study that acupuncture is effective for immediate analgesia in acute migraine attacks, but with limitations such as a small sample size and no control group[14]. Further research is needed to support the immediate analgesic effect of acupuncture in migraine.

Objectives

This study aims to evaluate the immediate analgesic effect of acupuncture for acute migraine attacks.

METHODS AND ANALYSES

The study protocol was designed in accordance with standard protocol project design: Recommendations in the Guidelines for Interventional Trials[15] (Online supplemental **file 1**). The study protocol was approved by the Medical

Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine (2022-2023).

Patient and public involvement

No patient involved.

Study design and setting

This randomised and sham-controlled clinical trial was designed to evaluate the efficacy of acupuncture for acute migraine attacks. This study will be conducted in the Second Affiliated Hospital of Yunnan University of Chinese Medicine. Eighty patients with migraine will be recruited. The duration of the study is 10 minutes, including at baseline, 0-2 minutes (during treatment), 4 minutes (during treatment), 6 minutes (during treatment), 8 minutes (during treatment), and 10 minutes (at the end of treatment). Each group will receive 10 minutes of treatment, a total of 1 treatment. The flow chart of the study procedure is shown in **Figure 1.** Patient enrollment, intervention, and assessment schedules are shown in **Table 1.**

Table 1 Study schedule for data measurements

	STUDY PERIOD					
	Baseline period (minutes)	Treatment period (minutes)				
TIMEPOINT	0	0-2	4	6	8	10
ENROLMENT:						
Eligibility screen	×					
Sign informed consent	×					
Inclusion/exclusion criteria	×					
Physical examination	×					
Randomisation	×					
INTERVENTIONS:						
Acupuncture group		×	×	×	×	×
Sham acupuncture group		×	×	×	×	×
ASSESSMENTS:						

Basic situation of headache	×					×
VAS	×	×	×	×	×	×
Satisfaction evaluation						×
Adverse event		×	×	×	×	×
Compliance evaluation						×
Blind evaluation						×
Safety evaluation						×
PARTICIPANTS SAFETY						
AE						×

Abbreviations: VAS, visual analogue scale; AE, adverse events.

Recruitment and informed consent

All participants will be recruited from the Second Affiliated Hospital of Yunnan University of Chinese Medicine and Kunming communities. A public recruitment advertisement for this trial will be designed to recruit the patients online or offline (e.g. WeChat public account, websites). Neurologists will determine whether patients are eligible to participate in this study based strictly on inclusion and exclusion criteria. If patients who are interested and volunteer to participate in this trial meet the inclusion criteria, they will sign written informed consent before the start of the study (Online supplemental **file 2**). They will be fully informed of the research information including the study procedures, benefits, and potential risks, except for the information about the needling site. They are free to withdraw from the study without penalty at any time and without any negative impact on their future medical treatment.

Study population

Inclusion criteria

Participants who meet all of the following requirements will be considered for inclusion: (1) meet the diagnostic criteria for migraine without aura in the International Classification of Headache Disorders ICHD-3 designated by the International Headache Society (IHS) in 2018; (2) unilateral migraine, male or female, aged between 18 and 60 years; (3) patients who are experiencing

acute migraine attacks; (4) duration of acute migraine attacks ≤ 24 hours; (5) the severity of headache is moderate to severe (VAS 4-9); (6) volunteer to participate and sign the informed consent.

Excluded criteria

Patients will be excluded if they have (1) patients with bilateral or alternating unilateral migraine; (2) any history of head trauma, headache of other types or unknown diagnosis, or cervical headache; (3) complicated with cardiovascular and cerebrovascular, liver, kidney, hematopoietic system and other serious primary diseases and other organic diseases; (4) severe anxiety, depression, insomnia and other mental diseases or intellectual disabilities, unable to cooperate with the questionnaire, or infection, bleeding disorders, allergies, skin diseases; (5) patients who have already taken analgesics since the current migraine attack; (6) pregnant or lactating patients; (7) participating in other similar studies.

Removed criteria

(1) All cases that do not meet the inclusion criteria and are mistakenly included should be eliminated; (2) patients whose trials are terminated due to serious adverse events or complications that made it inappropriate to continue treatment.

Randomisation and blinding

The participants will be randomised in a ratio of 1:1 to the Acupuncture group, and the Sham acupuncture group. To avoid selection bias, random numbers were generated using SPSS 22.0 statistical software (SPSS Inc., Chicago, IL, USA) and sealed in opaque envelopes. To avoid selection bias, random numbers will be generated by an independent research assistant using a computer and sealed in opaque envelopes. After participants accept the principle of random allocation, they will randomly conduct to select an opaque

envelope and obtain an allocation sequence number, which will be recorded into a case report form (CRF) by a specially assigned person. The participants, researchers, outcome assessors, and statisticians will be blinded to the group allocation throughout the study. Because of the particularity of the sham acupuncture technique, acupuncturists could not be blinded.

Intervention

The intervention measures will be in accordance with the Uniform Standard for Trial Reporting[16] and the Standard for Reporting Interventions in Clinical Trials of Acupuncture and Moxibustion[17]. According to clinical experience, previous research, and TCM theory (most migraine is Shaoyang meridian headache), shu points and specific acupoints of Shaoyang meridian will be selected as prescriptions. Among them, TE3 (Zhongzhu), TE5 (Waiguan), GB41 (Zulinqi), GB34 (Yanglingquan), GB20 (Fengchi), and GB8 (Shuaigu). All acupoints will be located according to the 2010 World Health Organization standard (ISBN: Tel: 9787117123327). The acupoint locations are shown in **Table 2** and **Figure 2.**

Table 2 Location of acupoints

Acupoints	Location
TE3 (Zhongzhu)	On the dorsum of the band, between the fourth and fifth metacarpal bones, in the depression proximal to the fourth metacarpophalangeal joint.
TE5 (Waiguan)	On the posterior aspect of the forearm, midpoint of the interosseous space between the radius and the ulna, 2 B-cun proximal to the dorsal wrist crease.
GB41 (Zulinqi)	On the dorsum of the foot, distal to the junction of the bases of the fourth and fifth metatarsal bones, in the depression lateral to the fifth extensor digitorum longus tendon.
GB34 (Yanglingquan)	On the fibular aspect of the leg, in the depression anterior and distal to the head of the fibula.
GB20 (Fengchi)	In the anterior region of the neck, inferior to the occipital bone, in the depression between the origins of sternocleidomastoid and the trapezius muscles.
GB8 (Shuaigu)	On the head, directly superior to the auricular apex,1.5 B-cun

superior to the temporal hairline.

Appliance selection

(1) Park Sham Acupuncture Device (PSD) (see **Figure 3)**: includes transparent guide tube (Φ4x20mm, Φx35mm), double-sided tape (Φ1x15mm), and the opaque plastic base (Φ4x15mm, Φ5x10mm), Suzhou Medical Supplies Factory Ltd, lot no.9018390000, China.

(2) Acupuncture needle: use the Huatuo brand disposable acupuncture needles produced by Suzhou Medical Supplies Factory Ltd, China. Manufacturer's license number: Su Food and Drug Administration of Machinery Production 20010020; Registration certificate number: 201622770970. specifications of acupuncture are 0.30x(25mm, 40mm).

(3) Blunt needle: use retractable stainless steel blunt needle (0.25x25mm, 0.25x40mm), Suzhou Medical Supplies Factory Ltd, lot number: 9018390000, China.

Operation

Manipulation Prior to the acupuncture procedure, participants will be placed in a prone position while the acupuncturist routinely sterilized the skin around the acupoints. All two groups will use the PSD.

Acupuncture group:

PSD+acupuncture needle will be used. After removing the skin side of the base of the PSD double-sided tape, and then import the disposable acupuncture needle, exposing the tip of the needle, it will be fixed on the acupuncture point and pierced into the skin, and the twisting, lifting and inserting, flat complementary and flat diarrhea techniques will be performed to achieve the needling sensation occurs.

Sham acupuncture group:

PSD+blunt needle will be used. After removing the skin-facing double-sided tape on the base, a retractable blunt needle will be introduced, and the blunt

needle tip will retract back into the hollow needle handle by force when it touches the skin and will not pierce the skin, but the participants will feel the sensation of needle prick. The acupoints on the extremities will be glued to the skin by means of double-sided tape on the base, and on the head, which is affected by the hair, we will use hairpins to fix them. (Online supplemental **Figure 1)**

The duration of needle retention for both groups will be 10 minutes per session. Following the treatment, patients will be advised to take analgesic medication or seek other forms of pain relief if their headache persists, based on their condition. The treatment will be performed by a single acupuncturist with more than 3 years of clinical experience. Data will be collected at baseline time and the end of treatment (after 10 minutes) (Online supplemental **flie 3**). The table will be diligently recorded in real-time by an unbiased medical assistant during the acupuncture procedure, ensuring that they remain uninformed about the subsequent assessment of results. This approach guarantees the integrity of the data collection process and maintains impartiality during the evaluation phase.

Emergency treatment

During treatment, if the patient's headache remains unrelieved or even worsens during treatment to the extent that it is unbearable, we will discontinue the trial immediately and initiate emergency treatment. This can include emergency analgesics such as NSAIDs and transporting the patient to the emergency department as advised by the emergency physician for further management. Additionally, If patients in the sham acupuncture group do not experience relief, they will receive acupuncture treatment or other emergency treatment.

Outcomes

Primary outcome

The primary outcome is the pain visual analogue scale (VAS) score assessed before and after treatment at 10 min[18].

Secondary outcomes

The secondary outcomes include the pain VAS score assessed at 0-2, 4, 6, and 8 min, blinding assessment and treatment effectiveness expectations scale.

(1) The VAS will be assessed seven times in total, including at baseline, 0-2 minutes (during treatment), 4 minutes (during treatment), 6 minutes (during treatment), 8 minutes (during treatment), and 10 minutes (at the end of treatment). The VAS is an assessment tool in which patients indicate their level of pain on a continuous line of 10 cm, ranging from no pain to the worst possible pain; Higher scores on the VAS indicate a more severe pain experience. The scale of the VAS of pain is shown in online supplemental **file 3**.

(2) Blinding assessment will be used to assess the validity of the blinding. At the end of each session, participants will be asked to complete a questionnaire stating whether they felt they received active treatment ("yes" or "no") and their level of confidence in receiving active treatment on a scale of 0-10. This simple and straightforward de-blinded questionnaire will be made available to all participants (Online supplemental **file 4**).

(3) The treatment effectiveness expectations scale will be tested to gauge participants' expectations regarding the effects of acupuncture treatment. Upon completing each session, participants will be asked to provide their anticipated treatment outcome ("effective" or "ineffective") and to rate the degree to which they perceived receiving positive treatment and the expected treatment outcome using a numerical rating scale ranging from 0 to 10 (Online supplemental **file 4**).

Sample size

This study is a superiority trial designed to test whether the efficacy of acupuncture is superior to the efficacy of sham acupuncture. Based on our previous clinical study[14], the change in VAS before and after the treatment of moderately severe acute migraine with acupuncture is 5.04 ± 1.63, We hypothesised that after 10 minutes of treatment, The difference in the acupuncture group is 5.04±1.63, and in the sham acupuncture group is 1.51 ±1.63, to evaluate whether the needling group is superior to the sham group, set α=0.025 (unilateral), β=0.1, Δ=2.3, and K=1. Using the following formula[19], we calculate the required sample size for both groups:

$$n_c = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2 \sigma^2 \left(1 + \frac{1}{K}\right)}{(\mu_T - \mu_C - \Delta)^2}$$

According to the formula, it is estimated that a minimum of 72 patients would be required, taking into account a loss rate of 8 percent. It is calculated that 40 patients should be included in each group, for a total of 80 patients.

Statistical analysis

The statistical analyses will be performed using SPSS 22.0 statistical software (SPSS Inc., Chicago, IL, USA). The detailed statistical protocol of this trial will be made by independent statistician. Qualitative data will be described by percentages or proportions, and quantitative data will be expressed as mean ± standard deviation (SDs) with a 95% CI. Independent t-test or Mann-Whitney U-test and χ^2-test or Fisher's exact test will be applied for the analysis of continuous and categorical variables, respectively. To assess baseline characteristics and the documentation of primary and secondary outcomes, the intention-to-treat (ITT) principle will be applied. The significance level will be set at 0.05 using a two-sided test.

Patient and public involvement

Patients and the public will not be involved in the planning or design of the study. They will not be involved in the recruitment, conduct, or report of the study. The study results will be disseminated to the participants and public in the forms of educational talks and booklets or flyers and published in open access peer-reviewed journals.

Trial status

The trial will begin recruitment and treatment on June 1, 2023, and is expected to be completed by June 30, 2025.

Data management and confidentiality

The researcher will fill in the initial data in the CRF of each participant in a timely and careful manner and enter them into an Excel sheet, the participants will be entered as random numbers, the researcher will not be able to identify the real information of the participants, and the data collector will be responsible for storing and managing the various types of data, and the data will be strictly proofread. Each participant's CRF will be completed in a timely and carefully manner by the investigator. The data collector is responsible for keeping and managing various data and rigorously proofreading the data, and the research director will regularly check the authenticity of the data collection. Personal information of all participants, such as name, phone number, medical records, etc. will be kept anonymously to prevent information leakage. The data of all participants will be kept by the researchers in a special cabinet and will be kept for at least 5 years after publication. The Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine will regularly review the progress of the trial and supervise the collection, allocation, and concealment of data. Modifications or termination of the trial could be performed by the committee. The data monitoring committee is independent of the sponsors and had no conflicts of interest.

Adverse events reporting and safety monitoring

During the study period, participants may suffer from AE, such as dizzy with needles and headache aggravated rather than alleviated, which will be given timely and proper treatment, carefully recorded in the CRF, and reported to the study leader and the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Traditional Chinese Medicine. All AEs will be compared between groups using the χ^2 test or Fisher's exact test.

Ethics and dissemination

This study was approved by the Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine on October 6, 2022 (2022-008), and conformed to the Declaration of Helsinki. All participants must provide written informed consent before participating in the trial. Data handling will be done anonymously, and only the participant code available in the central database. All personal information on potential and enrolled participants out of the scope of this trial will not be collected, shared, or maintained to protect confidentiality before, during, and after the trial. The results of this study will be published in a peer-reviewed journal and presented at conferences.

DISCUSSION

Migraine is a chronic disease that is difficult to cure completely and requires long-term maintenance treatment. Patients in the acute phase of the attack desperately need immediate pain relief. Studies have shown that acupuncture can inhibit sympathetic nerve function in migraine patients, reduce the number and frequency of headache attacks, and also show obvious advantages in rapid analgesia[20]. Therefore, the results of this study may provide credible clinical evidence for the effectiveness of acupuncture in the treatment of acute migraine.

Migraine is often unilateral and classified as Shaoyang headaches in traditional Chinese medicine. Therefore, acupoint prescriptions usually target pain relief points situated along the Shaoyang Meridian[14]. In addition, as a kind of acupuncture, the action mechanism of contralateral acupuncture (CAT) is related to the central nervous system. Studies demonstrate that CAT is vital in relying on the brainstem, cerebral cortex, and reticular structures within the central nervous system. By leveraging these important structural foundations, acupuncture signals are diffused and propagated bilaterally and extensively up to the brainstem level, proving beneficial in treating various pain-related illnesses[21]. CAT, a classical traditional Chinese acupuncture technique, refers to the method of taking acupoints on the healthy side. In China, the CAT is widely used in pain diseases caused by various reasons and has demonstrated favorable clinical efficacy[22,23]. Some studies have shown that CAT has better efficacy than ipsilateral acupuncture (IAT)[24,25].

In addition, migraines often occur unilaterally, with pain sites distributed to the left and right. The pathological mechanism study has found that migraine also has the phenomenon of left and right shunt of vascular distribution[26], the difference of functional response between the left and right central hemisphere[27], and the asymmetry of pain-related substances (dimethylarginine, etc.)[28]. Consequently, the inclusion criteria for this study focus primarily on unilateral migraines. The study also found that acupuncture on the healthy side could awaken the circumflex area, indicating that unilateral acupuncture can stimulate the contralateral area at the same time, providing some objective support for the treatment of painful diseases[29]. Therefore, it is feasible to validate the efficacy of CAT in patients with unilateral migraine.

Some studies have shown that sham acupuncture produces greater treatment effects than drugs containing a placebo[30]. In this study, we utilized the blunt non-penetrating needle as the control group to reduce any bias caused by opening the blind[31,32]. During the acupuncture procedure, the blunt needle is touched to the skin surface as much as possible, so that the

patient had a slight tingling sensation, so as to reduce the difference in needling sensation and effectively avoid the occurrence of blind bias. Previous investigations on acute pain acupuncture therapy have observed treatment effects within 15 to 30 minutes[33,34]. To achieve optimal treatment effects in a shorter time frame, we based our study design on our previous research, which found that acupuncture can provide relief for migraine within 10 minutes[14]. Thus, the observation time in this study is 10 minutes.

In addition, this study is the first randomized controlled study to evaluate the immediate analgesia efficacy of acupuncture for acute migraine attacks, and the findings will provide clinical evidence for acupuncture in the treatment of acute migraine attacks. Compared to medication, acupuncture offers treatment for acute migraine attacks without the potential side effects of drugs. This study can be seen in light of some limitations. First, it should be noted that this is a single-center study. While there may be potential biases compared to a multi-center study, the quality of a single-center study can be more easily controlled to ensure more accurate results. Second, there is no positive drug control group was set up in this study. Positive drugs are used as routine medicine, with controlled treatment with acupuncture and positive drugs available at a later period of time. Third, the acupuncturist was not blinded to the group allocation, which could potentially introduce some subjective bias and impact the trial's outcomes. Furthermore, it's worth noting that administering acupuncture treatment requires experienced and credentialed acupuncturists, which might limit its widespread popularity and practicality in clinical settings.

In summary, immediate analgesia is a major need for migraine patients during acute attacks. Acupuncture has been considered as a better option for immediate headache relief. However, there is a lack of sufficient clinical evidence to support this. This study aims to evaluate the immediate analgesic effect of acupuncture in the treatment of acute migraine attacks, and the

findings will provide reliable evidence for the application of acupuncture in acute migraine attacks.

Acknowledgments The authors would like to thank all the patients for participating in this study and the medical workers not listed in the article.

Contributors Y-H and Q-FL contributed equally to this work and are co-first authors. T-PG and F-RL are co-corresponding authors. T-PG, Y-H, Q-FL, and F-RL contributed to the protocol design and writing of the manuscript. G-YZH is responsible for the design of randomisation. X-MP, X-T, and R-RZ are responsible for data entry. S-WZ and Z-LL are responsible for acupuncture treatment. Z-WC and J-BS are responsible for guidance and statistics. All authors approved the final manuscript.

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Competing interests None declared.

Provenance and peer review Not commissioned; externally peer-reviewed.

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Figure legends

Figure 1 Flowchart of the research procedure

Figure 2 Location of acupoints

Figure 3 Park Sham Acupuncture Device

Note: The person depicted is not a patient and the picture was taken with the participant's knowledge.

Supplemental files

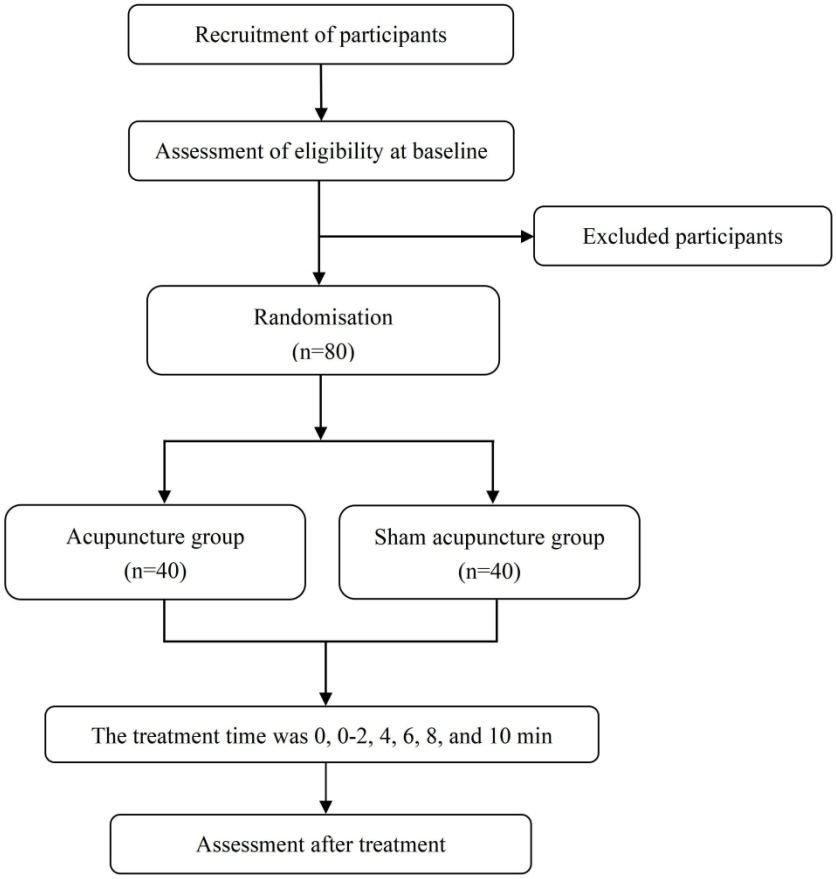
file 1 SPIRIT_Fillable-checklist-15-Aug-2013

file 2 Informed consent of participants

file 3 The data collection table

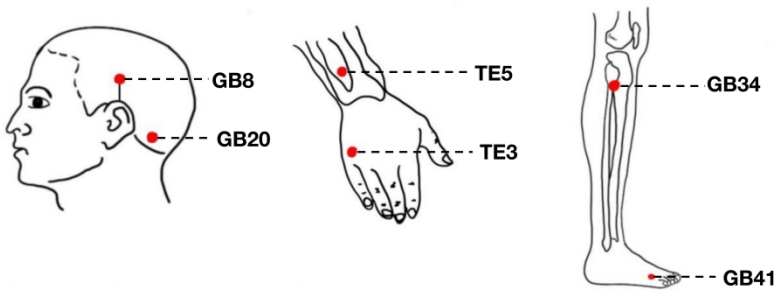
file 4 Blinding questionnaire and Treatment Expectations Scale

Online supplemental **Figure 1**



Flowchart of the research procedure

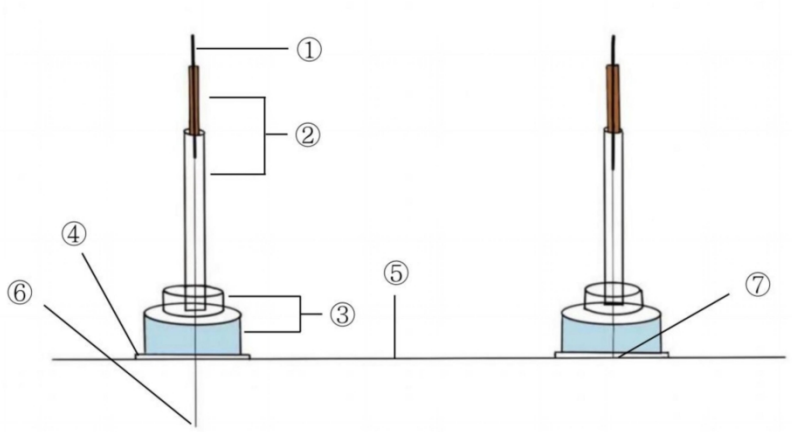
548x529mm (168 x 168 DPI)



Location of acupoints

354x171mm (576 x 576 DPI)

A



① Needle handle; ②Transparent guide tude; ③Opaque plastic base; ④Double-side tape; ⑤Skin; ⑥Sharp tip; ⑦Blunt tip

B

Hairpins to hold hair and needle

Park sham acupuncture device

A: Park Sham Acupuncture Device; B: Retaining needle

Park Sham Acupuncture Device

508x604mm (168 x 168 DPI)

SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Addressed on page number
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	2
	2b	All items from the World Health Organization Trial Registration Data Set	N
Protocol version	3	Date and version identifier	2
Funding	4	Sources and types of financial, material, and other support	14
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	1
	5b	Name and contact information for the trial sponsor	14
	5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	14
	5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	14

Introduction			
Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	2
	6b	Explanation for choice of comparators	3
Objectives	7	Specific objectives or hypotheses	3
Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	4
Methods: Participants, interventions, and outcomes			
Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	5
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	5
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	7
	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	7
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	7
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	7
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	9
Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	9

Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	9
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	5
Methods: Assignment of interventions (for controlled trials)			
Allocation:			
Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	10
Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	10
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	10
Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	10
	17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	10
Methods: Data collection, management, and analysis			
Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	10
	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	11

Data management	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	10
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	10
	20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	N
	20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	10
Methods: Monitoring			
Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	10
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	11
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	11
Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	11
Ethics and dissemination			
Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	2
Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	14

Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	14
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	N
Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	10
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	14
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	14
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	14
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	15
	31b	Authorship eligibility guidelines and any intended use of professional writers	15
	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	N
Appendices			
Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	5
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	N

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons "Attribution-NonCommercial-NoDerivs 3.0 Unported" license.

Informed Consent

Informed Page

Name of Project: Clinical study on the immediate analgesic effect of acupuncture in the treatment of acute migraine attacks.

Source of project: This work is financially supported by the National Natural Science Foundation of China (82260964), the "Liang Fanrong Expert Workstation" of Yunnan Province-Yunnan Provincial Science and Technology Plan Project (202305AF150072), the Youth Special of Yunnan Province Ten-thousand Plan (YNWR-QNBJ-2019-257), and the "Liu Zili Famous Doctor" special talent program of the Yunnan Provincial Xing Dian Talent Support Program (Yunnan Party Talent Office [2022] No. 8).

Project research organization: School of Second Clinical medicine/The Second Affiliated Hospital, Yunnan University of Chinese Medicine, Kunming, China.

Research leader: Taipin Guo

Dear patients,

First of all, thank you for your interest in our clinical research! We would like to invite you to participate in a clinical study on the immediate analgesic effect of acupuncture intervention within 10 minutes during acute migraine attacks. This study has been approved by the Medical Ethics Committee of the Second Affiliated Hospital of Yunnan University of Chinese Medicine. Before you decide whether or not to participate in this study, please read the following as carefully as possible. It will help you understand the study and why it is being conducted, the procedures and duration of the study, the benefits, risks and discomforts that may be brought to you by participating in the study. If you wish, you can also discuss it with your relatives and friends or ask your doctor to give explanations to help you make your decision.

Research introduction

I. Research background and research purposes

1. Research background

The contralateral acupuncture is an ancient classical acupuncture technique introduced in classical Chinese literature on acupuncture (*Huang Di Nei Jing*) that is more than 2000 years old.

It refers to the acupoints on the right side (healthy side) are selected for diseases on the left (affected side) and vice versa. Currently, contralateral acupuncture is widely used for unilateral onset diseases including pain and has shown good clinical efficacy. A study published in the journal BMJ showed that contralateral acupuncture has better efficacy in preventing migraine without aura than sham acupuncture and conventional treatment, and can significantly reduce the number of headache days and the number of episodes. Some studies have shown that acupuncture treatment has a faster onset of immediate pain relief and an earlier onset of decreased headache relief compared to oral ibuprofen.

Migraine is a common clinical condition and is the second most disabling condition worldwide, and may affect areas of professional, academic, social, family and personal life, as well as cardiovascular disease, mental illness and sleep disorders. Acupuncture is safe and effective in the treatment of migraine, and its efficacy has been recognised internationally in recent years. Our previous clinical observation found that the rate of complete pain relief after 10 min of acupuncture could reach 82% in patients with migraine without aura using contralateral acupuncture of Shaoyang meridian points. However, due to the problems of relatively small sample size and no control group, its efficacy needs to be further studied.

2. Research purposes

The purpose of this study is to evaluate the immediate analgesic effect of acupuncture intervention within 10 minutes during acute migraine attacks

3. Study expected number of participants

This study is expected to include 80 patients with migraine.

II. Who can participate in this study?

(1) meet the diagnostic criteria for migraine without aura in the International Classification of Headache Disorders ICHD-3 designated by the International Headache Society (IHS) in 2018;
(2) unilateral migraine, male or female, aged between 18 and 60 years;
(3) patients who are experiencing acute migraine attacks;
(4) duration of acute migraine attacks≤ 24 hours;
(5) the severity of headache is moderate to severe (VAS 4-9);
(6) volunteer to participate and sign the informed consent.

III. Who is not suitable for research?

(1) patients with bilateral or alternating unilateral migraine;
(2) any history of head trauma, headache of other types or unknown diagnosis, or cervical headache;
(3) complicated with cardiovascular and cerebrovascular, liver, kidney, hematopoietic system and other serious primary diseases and other organic diseases;
(4) severe anxiety, depression, insomnia and other mental diseases or intellectual disabilities, unable to cooperate with the questionnaire, or infection, bleeding disorders, allergies, skin diseases;
(5) patients who have already taken analgesics since the current migraine attack;
(6) pregnant or lactating patients;
(7) participating in other similar studies.

IV. What will be done if you participate in the research?

If you meet the inclusion criteria and agree to participate, you will first need to undergo relevant tests to check that you meet all the requirements to participate in the study.

1. Before you are included in the study, you will undergo the following tests to determine if you can participate in the study.

(1) Your medical history, clinical signs and symptoms will be interviewed and recorded; you will also be instructed to complete a visual analogue scale score (VAS) to determine whether you meet the inclusion criteria.

2. If you meet the inclusion criteria through the above screening, the study will be conducted according to the following steps:

(1) The trial will be divided into 2 groups. At the beginning of the study, your doctor will decide which group you will receive based on the random numbers provided by the computer.

(2) Acupuncture needle: use the Huatuo brand disposable acupuncture needles produced by Suzhou Medical Supplies Factory Ltd, China. Manufacturer's license number: Su Food and Drug Administration of Machinery Production 20010020; Registration certificate number: 201622770970. specifications of acupuncture are 0.30x(25mm, 40mm).

3. Other matters requiring your cooperation

In the course of treatment, you need to cooperate with the doctor to complete the relevant scale to fill in, truthfully answer the questions asked by the doctor, cooperate with the doctor, and provide feedback on your condition.

V. Possible benefits of participating in the study

You may benefit from this study, including the possibility of improvement in your condition and health education about migraine prevention and treatment.

VI. Adverse reactions, risks and protective measures for participating in the study

You may have soreness, numbness, heaviness and swelling during the acupuncture process, which are all normal reactions to acupuncture. There may be adverse reactions after needling, but they are rare and mild. You may feel dizzy during needling due to your physical condition or emotional stress, which can be relieved after stopping needling and taking proper rest; bleeding and haematoma may occur after needling, which will disappear after local pressure; however, if infection occurs at the site of needling, your doctor will deal with it promptly.

If you experience any discomfort, new changes in your condition, or any unforeseen circumstances during the study period, whether or not they are related to the acupuncture treatment, you should inform your doctor promptly and he/she will make a judgement and give appropriate medical treatment.

VII. Treatment options available to you other than participating in this study

Your doctor will discuss with you the other treatment options currently available for your condition, including the corresponding risks and benefits. For migraine, there are currently anti-inflammatory and analgesic drugs, mainly non-steroidal anti-inflammatory drugs (NSAIDs), which are effective and have side effects such as gastrointestinal bleeding, gastric ulcers and cerebrovascular accidents.

VIII. The relevant costs

All the costs of this project are supported by the National Natural Science Foundation of China (82260964), the "Liang Fanrong Expert Workstation" of Yunnan Province-Yunnan Provincial Science and Technology Plan Project (202305AF150072), the Youth Special of Yunnan Province Ten-thousand Plan (YNWR-QNBJ-2019-257), and the "Liu Zili Famous Doctor" special talent program of the Yunnan Provincial Xing Dian Talent Support Program (Yunnan Party Talent Office [2022] No. 8). If you participate in this study, you will receive free acupuncture treatment during the study period. This study will only observe the efficacy of the treatment once, and if the subsequent relief is not obvious, you can have 2 free acupuncture treatments, and insist on completing the treatment and the follow-up course of treatment. Doctors will make every effort to prevent and treat any harm that may occur as a result of this study. If an adverse event occurs during the clinical trial, a committee of medical experts will determine whether it is related to the acupuncture treatment or the study process. The sponsor will provide the cost of treatment and financial compensation for any harm related to the trial process in accordance with the provisions of China's Code of Practice for the Quality Management of Pharmaceutical Clinical Trials.

During the treatment period, if you have a combination of other medical conditions, the treatment and examination will not be free of charge.

IX.The confidentiality of clinical data

Your medical records (study charts/CRFs, etc.) will be kept intact at the hospital where you are seen. The investigator, ethics committee and drug regulatory authorities will be given access to your medical records. Any public reporting of the results of this study will not disclose your personal identity. We will make every effort to protect the privacy of your personal medical information to the extent permitted by law.

X. You can voluntarily choose to participate in research and withdraw from the study

Whether or not to participate in the research is entirely up to you. You may decline to participate in the study or withdraw from the study at any time during the study, which will not affect your relationship with the doctor and will not affect your medical or other benefits.

In your best interest, your doctor or researcher may discontinue your participation in this study at any time during your research. If you withdraw from the study for any reason, you may be asked about your use of the trial drug.

Your physician will promptly notify you if an important subject-related event or information occurs during the course of the study that may affect your willingness to continue participating in the study.

XI. What should I do now?

Participation in this clinical study is based on a completely voluntary principle and needs to be carried out with your consent and signed informed consent. Whether or not you participate in this clinical study depends entirely on your wishes. You have the right to suspend and withdraw from this research treatment at any time. Exiting this study will not affect your medical treatment.

Your physician may suspend your participation in this study in advance if: Your health condition is not suitable for continued participation, or you may not comply with the research program

requirements.

The doctor will promptly notify you or your legal representative if there is medical information that may affect your willingness to continue your research during the study. Before you decide to participate in this study, please ask your life as much as possible until you fully understand this test study.

If you have any questions, suggestions or complaints about this study, please do not hesitate to discuss them with the research team, whose contact details can be found on the signature page. If you feel inconvenienced to communicate with the research team, you can consult or complain to the Medical Ethics Committee of the Second Affiliated Hospital of Yunnan University of Traditional Chinese Medicine. Ethics Committee contact number:15125208547.

Thank you for reading the above material. If you decide to take part in this study, please let your doctor know and he/she will make all the arrangements for you to study.

Informed Consent

Signature Page

1. I have carefully read the contents of the informed consent form, and the researchers have answered my questions.

2. Having fully understood the purpose, methods, possible therapeutic benefits and risks to be encountered and other terms of this clinical study as mentioned in the informed consent form, I voluntarily participate in this study and promise to cooperate fully with the investigators.

3. I understand that I can withdraw from the study at any time and I do not need any reason. The medical services I receive and the legal rights I enjoy are not affected at all.

Finally, I decided to agree to participate in this study and to ensure compliance with my doctor's advice.

Subject Signature: _____ Date: _____

Contact Number: _____

I have explained fully detail to the subjects, including the potential risks.

Doctor/Researcher Signature: _____ Date: _____

Contact Number: _____

知情同意书

告知页

项目名称：针刺治疗偏头痛急性发作期即刻镇痛效果的临床研究

项目来源：国家自然科学基金项目(82260964)、云南省-云南省科技计划项目(202305AF150072)“梁繁荣专家工作站”、云南省万计划青年专项(YNWR-QNBJ-2019-257)、云南省兴滇人才支持计划“刘自立博士”特聘人才项目(云南省党办人人办[2022]8 号)资助。

课题研究单位：云南中医药大学针灸推拿康复学院/第二附属医院

项目负责人：郭太品

亲爱的患者:

首先，感谢您对我们这项临床研究的关注！我们将邀请您参加一项“针刺治疗偏头痛急性发作期即刻镇痛效果的临床研究”。本研究已通过云南中医药大学第二附属医院医学伦理委员会审核，同意进行临床研究。在您决定是否参加这项研究之前，请尽可能仔细阅读以下内容。它可以帮助您了解该项研究以及为何要进行这项研究，研究的程序和期限，参加研究后可能给您带来的益处、风险和不适。如果您愿意，您也可以和您的亲属、朋友一起讨论，或者请医生给予解释，帮助您做出决定。

研究介绍

一、研究背景和目的

1. 研究背景

巨刺法是中国古典针灸文献《黄帝内经》中介绍的一种古老的经典针灸技术，距今已有2000 多年的历史。它指的是选择右侧(健康侧)的穴位来治疗左侧(患病侧)的疾病，反之亦然。目前，巨刺法被广泛应用于包括疼痛在内的单侧发病疾病，并显示出良好的临床疗效。发表在《英国医学杂志》(BMJ)上的一项研究表明，巨刺法在预防无先兆偏头痛方面的疗效优于假针灸和常规治疗，并能显著减少头痛天数和发作次数。一些研究表明，与口服布洛芬相比，针灸治疗可以更快地立即缓解疼痛，更早地缓解头痛。

偏头痛是一种常见的临床疾病，是全球第二大致残疾病，可能影响专业、学术、社会、家庭和个人生活领域，以及心血管疾病、精神疾病和睡眠障碍。针灸治疗偏头痛安全有效，近年来其疗效已得到国际认可。我们前期临床观察发现，对侧针刺少阳经穴治疗无先兆偏头

痛患者，针刺 10 min 后疼痛完全缓解率可达 82%。但因存在样本量相对较小，未设置对照组等问题，其疗效有待进一步研究。

2. 研究目的

这项研究的目的是评估针刺干预在急性偏头痛发作 10 分钟内的即时镇痛效果。

3. 研究预计纳入参试者例数

本研究预计纳入 80 例偏头痛患者。

二、哪些人能参加这项研究?

1.符合以下条件的人，将会被邀请参加这项研究：

(1)符合国际头痛学会(IHS) 2018 年指定的国际头痛疾病分类 ICHD-3 中无先兆偏头痛的诊断标准;

(2) 单侧偏头痛，男性或女性，年龄在 18 岁至 60 岁之间;

(3) 急性偏头痛发作的患者;

(4) 急性偏头痛发作≤6 小时;

(5) 头痛严重程度为中度至重度(VAS 4-9);

(6) 自愿参与并签署知情同意书。

三、哪些人不宜参加本研究

(1) 双侧或交替单侧偏头痛患者;

(2) 有头部外伤史、其他类型或不明诊断的头痛或颈性头痛;

(3) 合并心脑血管、肝、肾、造血系统等严重原发疾病及其他器质性疾病的;

(4) 严重焦虑、抑郁、失眠等精神疾病或智力障碍，无法配合问卷调查，或感染、出血性疾病、过敏、皮肤病;

(5) 偏头痛发作后曾服用过镇痛药的患者;

(6) 孕妇、哺乳期患者;

(7) 参与其他类似研究。

四、如果参加研究将要做什么?

1. 在您入选研究前：

(1) 医生将询问并记录您的病史、临床症状和体征；医生还将指导您填写头痛发作强度视觉模拟量表评分（visual analog scale score, VAS）等，以确定您是否符合纳入的标准。

2. 若您通过以上筛查符合纳入标准，将按以下步骤进行研究

（1）试验将分为 2 组。在研究开始时，你的医生将根据电脑提供的随机数决定你将接受哪一组。

（2）针灸针:使用中国苏州医疗用品厂有限公司生产的华佗牌一次性针灸针。生产企业许可证号:苏食品药品监督管理局机械生产 20010020;注册证号码:201622770970。针灸规格为 0.30 × (25mm、40mm)。

3. 需要您配合的其他事项

在治疗过程中，您需要配合医生完成相关量表填写，如实回答医生提问的问题，配合医生，对您病情进行反馈。

五、参加研究可能的受益

您将可能从本项研究中受益。此种受益包括您的病情有可能获得改善，以及对您进行预防偏头痛发生的健康教育。

六、参加研究可能的不良反应、风险和不适、不方便

针刺过程中您可能会有酸、麻、重、胀的感觉，这均为针刺的正常反应。针刺后可能存在不良反应，但较少而轻微，针刺时可能因为您的体质问题或情绪紧张出现晕针现象，停止针刺和适当休息后可缓解；针刺后可能出现出血、血肿等现象，经局部按压后可消失；但如果针刺部位出现感染，您的医生会及时处理。

如果在研究期间您出现任何不适，或病情发生新的变化，或任何意外情况，不管是否与针刺治疗有关，均应及时通知您的医生，他/她将对此作出判断并给与适当的医疗处理。

七、除参加本研究外，您可选的其他治疗

您的医生将与您讨论目前针对您的病情可选择的其他治疗方案，包括相应的风险和益处。针对偏头痛的患者，目前可以选择非甾体类抗炎药(NSAIDS) 为主的消炎镇痛药进行治疗，作用效果较好，主要存在胃肠道出血、胃溃疡、脑血管意外等副作用。

八、有关费用

本课题所有费用由国家自然科学基金项目(82260964)、云南省-云南省科技计划项目(202305AF150072)“梁繁荣专家工作站”、云南省“万人计划”青年拔尖人才专项

（YNWR-QNBJ-2019-257）和云南省兴滇英才支持计划“名医”专项（云党人才办[2022]18号）项目资助。如您参见本研究，在研究期间，将得到相关免费针刺治疗。本研究仅观察治疗一次的疗效，如后续疗效缓解不明显，可免费做 2 次针刺治疗，坚持完成治疗与随访疗程。医生将尽全力预防和治疗由于本研究可能带来的伤害。如果在临床试验中出现不良事件，医学专家委员会将会鉴定其是否与针刺治疗或研究过程有关。申办者将按照我国《药物临床试验质量管理规范》的规定对与试验过程中相关的损害提供治疗的费用及相应的经济补偿。

在治疗期间，如果您同时合并其他疾病所需的治疗和检查，也将不在免费的范围之内。

九、个人信息是保密的吗?

您的医疗记录（研究病历/CRF 等）将完整地保存在您所就诊的医院。研究者、伦理委员会和药品监督管理部门将被允许查阅您的医疗记录。任何有关本项研究结果的公开报告将不会披露您的个人身份。我们将在法律允许的范围内，尽一切努力保护您个人医疗资料的隐私。

十、可以自愿选择参加研究和中途退出研究

是否参加研究完全取决于您的意愿。您可以拒绝参加此项研究，或在研究过程中的任何时间退出本研究，这都不会影响您和医生间的关系，都不会影响您的医疗待遇与权益，或有其他方面利益的损失。

出于对您的最大利益考虑，医生或研究者可能会在研究过程中随时中止您继续参加本项研究。如果您因为任何原因从研究中退出，您可能被询问有关您接受针灸或药物治疗的情况。

研究过程中如果发生与受试者相关的重要事件或信息，可能会影响您继续参加研究的意愿时，您的医生将及时通知您。

十一、怎样获得更多的信息?

参加本项临床研究，本着完全自愿的原则，需要在您同意并签署知情同意书的前提下进行。是否参加本项临床研究，完全取决于您本人的意愿，您有权在任何时候选择中止和退出本项研究性治疗，退出本研究并不会影响您的医疗待遇。

您的医师可以在下列情况下提前中止您继续参加本项研究：您的健康状况不适合继续参加，或者您不能遵守研究方案的要求。

如在研究过程中出现可能影响您继续参加研究意愿的医学信息，医生将及时通知您或者

您的法定代表。在您做出参加本研究的决定前，请尽可能向您的医生询问有关问题，直至您对本项试验研究完全理解。

如您对这项研究存在任何疑问、建议或投诉，请及时与研究团队讨论，联系方式见签字页。如您感觉不便与研究团队沟通，可向云南中医药大学第二附属医院医学伦理委员会进行咨询或投诉。伦理委员会联系电话:15125208547。

感谢您阅读以上材料。如果您决定参加本项研究，请告诉您的医生， 他/她会为您安排切有关研究的事务。

知情同意书

签字页

1. 我已经仔细阅读了知情同意书告知页的内容，研究者已解答了我提出的疑问。

2. 我在充分理解了知情同意书提及的本项临床研究的目的、方法、可能获得的治疗利益和可能遇到的风险以及其他条款后，自愿参加此项研究，并承诺与研究者充分合作。

3. 我明白我可在任何时候退出研究，并且不需要任何理由，我得到的医疗服务和享有的法律权利不受任何影响。

最后，我决定同意参加本项研究，并保证遵从医嘱。

受试者签名:_____ 日期：_____年_____月_____

联系电话:_____

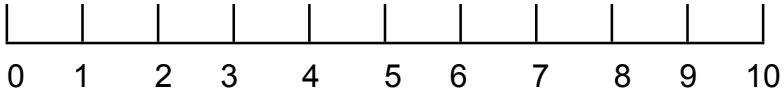
我确认已向患者解释了本研究的详细情况，包括其权力及可能的受益和风险。

医生/研究者签名:_____ 日期：_____年_____月_____

联系电话:_____

The data collection table

Use a 10cm VAS scale with a moving scale between 0 and 10 on the front and a number from 0 to 10 on the back, with 0 being no pain and 10 being the most painful. Please state your pain level according to the following scale.



VAS scale (0-10 points)

0: no pain; 1-3: light pain; 4-6: moderate pain; 7-10: severe and unbearable pain.

Projects	Before treatment	Treatment				
	0min	2min	4min	6min	8min	10min
pain VAS score						

Blinding test

Do you think you were given acupuncture treatment or placebo acupuncture?	Yes ☐ No ☐
How sure are you on your answer on a scale of 0 to 10? (0 = very uncertain and 10 = completely certain)	_____

Treatment Expectations Scale

What do you think of the results of your treatment?	Efficiently ☐ Inefficiently ☐
How sure are you on your answer on a scale of 0 to 10? (0 = very uncertain and 10 = completely certain)	_____

Hairpins to hold hair and needle

Park sham acupuncture device

353x207mm (300 x 300 DPI)