

# INPLASY PROTOCOL

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submission:** Preliminary  
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**Conflicts of interest:**  
None declared.

## Evaluation of the Effectiveness and Safety of Acupuncture in the Treatment of Cervicogenic Hypertension A Protocol for Systematic Review and Meta-analysis

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**Review question / Objective:** The purpose of this study is to explore the efficacy and safety of acupuncture in the treatment of patients with cervicogenic hypertension, Through scientific verification, it provides clinicians with application reference and provides more choices for patients to solve pain. Patients included should have a clear diagnosis of cervicogenic hypertension(In the absence of antihypertensive drugs, blood pressure was measured 3 times a day, systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg; or a clear history of hypertension and Diagnosis of cervical spondylosis using computed tomography, magnetic resonance imaging, and other imaging methods); The intervention group received acupuncture treatment alone or acupuncture combined with treatment by Chinese herbal medicine or conventional Western medicine; The control group was a blank control group, a placebo group, a fake acupuncture group or received treatment only through conventional Western medicine; The Inclusion criteria of study type was an RCT; The outcomes of the main analyses were efficacy of clinical symptoms, systolic blood pressure value, Diastolic blood pressure value; Secondary outcome indicators were Traditional Chinese Medicine syndrome curative effects, Traditional Chinese Medicine syndrome scores, and adverse reactions.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 December 2022 and was last updated on 09 December 2022 (registration number INPLASY2022120036).

### INTRODUCTION

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Through scientific verification, it provides clinicians with application reference and provides more choices for patients to solve pain. Patients included should have a clear diagnosis of cervicogenic hypertension(In the absence of antihypertensive drugs, blood pressure was measured 3 times a

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**Rationale:** As a common clinical secondary hypertension, cervicogenic hypertension seriously affects people's life and work. Because the occurrence and development of this hypertension is closely related to cervical spondylosis, many antihypertensive drugs are not effective in improving symptoms, resulting in many doctors feeling helpless and wanting to seek better complementary or alternative treatments. In recent years, an increasing number of clinicians have used acupuncture to treat hypertension, so in order to evaluate the effectiveness and safety of acupuncture in the treatment of cervicogenic hypertension, we conducted this study with the aim of providing a scientific reference for this alternative treatment.

**Condition being studied:** The concentration of carbon dioxide in the brain increases, and the excitability of the vascular motor center is enhanced, thereby causing an increase in blood pressure. Cervicogenic hypertension is a common clinical disease and frequent incidence, generally more common in middle-aged and elderly

people, but due to social changes, the acceleration of the pace of study, work, and life, the increase of bad living habits, its incidence has a younger trend, patients often due to dizziness, headache, tinnitus, hand numbness, palpitations, insomnia and dreams and other symptoms and feel pain. Antihypertensive drugs may be able to lower blood pressure, but they do not have a good effect on the above symptoms, so acupuncture, as a more convenient and safer treatment, can effectively relieve the symptoms of CH patients and reduce the occurrence of adverse events.

## METHODS

**Search strategy:** #1 hypertension (Mesh Terms)

#2 blood pressure, high (Title/Abstract)

#3 blood pressures, high (Title/Abstract)

#4 high blood pressure (Title/Abstract)

#5 high blood pressures (Title/Abstract)

#6 OR #1-#5

#7 cervical vertebra (Mesh Terms)

#8 Vertebrae (Title/Abstract)

#9 cervical (Title/Abstract)

#10 OR #7-#9

#11 Acupuncture (Mesh Terms)

#12 Acupuncture Therapy (Title/Abstract)

#13 Acupuncture Points (Title/Abstract)

#14 Acupuncture Analgesia (Title/Abstract)

#15 Pharmacopuncture (Title/Abstract)

#16 OR #11-#15

#17 Randomized controlled trial (all field)

#18 Controlled clinical trial (all field)

#19 Randomly (all field)

#20 Randomized (all field)

#21 Random allocation (all field)

#22 placebo (all field)

#23 OR #17-22

#24 #6 And #10 And #16 And #23.

**Participant or population:** Patients included should have a clear diagnosis of cervicogenic hypertension (In the absence of antihypertensive drugs, blood pressure was measured 3 times a day, systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg; or a clear history of hypertension and Diagnosis of cervical spondylosis using computed

tomography, magnetic resonance imaging, and other imaging methods) .

**Intervention:** The intervention group received acupuncture treatment alone or acupuncture combined with treatment by Chinese herbal medicine or conventional Western medicine.

**Comparator:** The control group was a blank control group, a placebo group, a fake acupuncture group or received treatment only through conventional Western medicine.

**Study designs to be included:** The Inclusion criteria of study type was an RCT.

**Eligibility criteria:** Exclusion criteria ①Those who do not meet the diagnostic criteria for CH; ②Secondary hypertension caused by craniocerebral injury, kidney, adrenal gland, goiter and the other reasons. ③People with serious complications; ④non-RCTs research or studies with duplicate data or incomplete data; case reports, animal experiments, research protocols, reviews, and conference summaries, etc. ⑤Incompleted data; ⑥Pregnant and lactating women.

**Information sources:** We will search PubMed, Embase, Web of Science, Cochrane Library, Chinese literature databases such as China National Knowledge Infrastructure, Wanfang Database, Chinese Scientific Journals Database, China Biomedical Literature Database, etc, and manually search relevant literature as supplementary searches.

**Main outcome(s):** The main outcomes were efficacy of clinical symptoms, systolic blood pressure value, Diastolic blood pressure value.

**Additional outcome(s):** The additional outcomes were Traditional Chinese Medicine syndrome curative effects,

Traditional Chinese Medicine syndrome scores, and adverse reactions.

**Data management:** Date management was done independently by two researchers (Yuning Xin and Hongyu Li). Firstly, read the title and abstract of each document, conduct a preliminary screening to exclude duplicate literature as well as animal experiments, case reports, or other literature that is clearly unrelated to this study; then read the full text further, determine whether to choose according to the inclusion and exclusion criteria; and finally extract information from the included literature. The extracted information included the first author, publication year, number of cases (including total sample size, sample size of the experimental group and sample size of the control group), sex, age, course of disease, intervention, control measures, course of treatment, outcome indicators, etc. The two men cross-checked after completing each other, and if there is any difference of opinion, it is handed over to a third researcher (Yinghui Liu) to resolve.

**Quality assessment / Risk of bias analysis:** Two investigators (Yuning Xin and Hongyu Li) independently applied the bias risk assessment tool provided by Cochrane Handbook for Systematic Review of Interventions, Version 5.1.0 (W. Liu, F. Y. Chu) to assess the quality of the included study literature. Specific evaluations included random sequence generation, allocation hiding, blinding implementation, completeness of outcome data, selective reporting, and other biases. These studies will be divided into three quality levels: high risk of bias, low risk of bias, and risk of unclear bias. If there is a disagreement, discuss it with a third investigator (Yinghui Liu).

**Strategy of data synthesis:** We chose RevMan5.4 software for data analysis, and the effect value of the counting data was used normal risk (RR), and the effect value of the measurement data was standardized mean difference (SMD), and 95% confidence intervals (CI) were calculated for both. For the assessment of

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heterogeneity between the results, it is generally believed that when  $I^2 > 0.05$ , it indicates that the level of heterogeneity is low, and a fixed-effects model is selected for analysis; otherwise, a random-effects model is used for analysis. If heterogeneity is large, subgroup or sensitivity analysis should be continued depending on the causes for which heterogeneity may occur.

Author 8 - Pengfei Li.  
Author 9 - Huize Han.

**Subgroup analysis:** When conducting subgroup analysis, we should consider factors such as age, disease course, intervention, treatment type, course of treatment, etc. that may lead to heterogeneous sources for subgroup analysis.

**Sensitivity analysis:** If necessary, we also conduct sensitivity analyses to assess the robustness of the included results. If the results are unstable, studies with high-risk bias will be removed.

**Language restriction:** All published randomized controlled trials in Chinese and English were included.

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

**Other relevant information:** The data included in this study were obtained from published articles and therefore did not require ethical approval.

**Keywords:** acupuncture; meta-analysis; cervicogenic hypertension; protocol; systematic review.

**Dissemination plans:** We will submit the final results to a peer-reviewed journal for publication.

**Contributions of each author:**

Author 1 - Yuning Xin - conceptualization, data curation, paper writing.

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Author 2 - Hongyu Li.

Author 3 - Gungyu Cheng.

Author 4 - Junfeng Cui.

Author 5 - Yinghui Liu.

Author 6 - Aidong Liu.

Author 7 - Xiaolin Xu.