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REVIEW

# Tuina Combined with Acupuncture and Other Therapies for Treating Cervicogenic Headache: A Network Meta-Analysis Based on Randomized Controlled Trials

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**Objective:** To systematically evaluate the therapeutic effect of tuina combined with different methods in the treatment of cervicogenic headache, so as to provide evidence-based basis for clinical selection of the optimal combined treatment.

**Methods:** Randomized controlled trials of tuina combined with other therapies for cervicogenic headache published in English and Chinese databases from the establishment of databases to November 11, 2025 were searched by computer. The Cochrane bias risk assessment tool was used to evaluate the quality of the literature. Stata 16.0 and R 4.2.0 softwares were used for network meta-analysis to compare the efficacy and visual analogue scale of different combined treatment methods, and the SUCRA was ranked.

**Results:** A total of 25 studies were included, involving 2559 patients and 11 combined treatment regimens. The analysis of the evidence volume showed that the number of studies on Acupuncture and Tuina was relatively large, and the evidence base was relatively solid; while the Blade needle and Tuina, Instrument-assisted soft tissue mobilization and Tuina schemes only had one study supporting them, and the evidence base was weak. The SUCRA ranking results showed that in terms of efficacy, Blade needle and Tuina, Acupotomy and Tuina, and acupuncture combined with Tuina ranked high; in terms of VAS scores, Blade needle and Tuina, Acupuncture and Tuina, and acupuncture combined with Tuina ranked high. However, since the ranking results are mostly based on small samples or single studies, and the evidence network lacks closed loops and the assumption of transferability faces challenges, the ranking results should be regarded as exploratory findings.

**Conclusion:** Acupuncture and Tuina is currently a combined treatment regimen with a relatively solid evidence base and can be used as a preliminary reference in clinical practice. Although Blade needle and Tuina performed well in the ranking, it was based on only one study, and the evidence strength was insufficient. It should not be regarded as a definitive recommendation. The main value of this study lies in systematically reviewing the current research status of Tuina combined treatment for cervicogenic headache, revealing the differences in evidence volume among different regimens, and indicating the direction for future research - priority should be given to conducting more high-quality studies on schemes with weak evidence bases but potential, and strengthening direct comparisons between different combined treatment regimens.

**Keywords:** cervicogenic headache, tuina, network meta-analysis, randomized controlled trial, combination therapy

## Introduction

Cervicogenic headache (CGH) is a type of secondary headache, and its incidence is increasing worldwide. A study conducted in 2025 indicated that the prevalence rate of cervicogenic headache ranged from 0.4% to 42%, while in the general population it was 0.17% to 2.2%, and it could reach 15% to 20% among patients with chronic headache.[1] Cervicogenic headache is a common type of secondary headache, and its pathogenesis is closely related to the lesions of the cervical spine and its surrounding tissues. This disease has shown a high prevalence worldwide, especially among office workers who spend prolonged hours using electronic

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devices.[2] Epidemiological studies have shown that the incidence of cervicogenic headache increases with age. Cervicogenic headache not only manifests as persistent headache symptoms, but also is often accompanied by neck stiffness, shoulder soreness and other discomfort, which seriously affects the quality of daily life of patients, and brings heavy disease burden to individuals and society. With the changes in modern lifestyles, CGH should receive more attention.[3]

The current treatment status of cervicogenic headache is diverse. The traditional treatment methods mainly include drug therapy and physical therapy. In terms of drug therapies, non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxants category is the most commonly used clinical drugs, these drugs by inhibiting the inflammatory reaction and relieve muscle tension to improve symptoms. However, long-term use of NSAIDs may lead to adverse gastrointestinal reactions, such as gastric ulcers and bleeding, while muscle relaxants may cause side effects such as drowsiness and dizziness, affecting patients' daily life and work efficiency.[3] As another auxiliary treatment, physical therapy includes traction, hot compress, electrotherapy, and manual therapy. These methods work by improving local blood circulation, relieving muscle spasms, and adjusting the mechanical structure of the cervical spine. Although physical therapy can significantly improve pain symptoms in the short term, its long-term efficacy remains controversial, with some patients experiencing symptom recurrence after treatment. Additionally, treatment efficacy varies among individuals, influenced by factors such as age, disease duration, symptom severity, and comorbidities. Moreover, most existing treatments focus primarily on symptom relief rather than addressing the underlying etiology of cervicogenic headache, which may contribute to suboptimal outcomes.[4]

As a non-drug therapy, Tuina has received extensive attention in the field of CGH treatment in recent years. Tuina encompasses a variety of techniques, including rolling, pressing, kneading, and manipulation of the cervical spine, each with distinct biomechanical effects on the cervical musculature and facet joints.[5] For instance, different treatment positions may influence clinical outcomes: one study demonstrated that supine Tuina achieved a total effective rate of 93.7%, significantly superior to 73.3% with the conventional sitting position ($P < 0.05$).[6] Evidence has shown that Tuina can not only effectively relieve pain, but also improve cervical spine function and quality of life. A randomized controlled trial comparing Tuina with oral ibuprofen reported that Tuina significantly reduced Visual Analog Scale (VAS) scores, headache frequency, and Neck Disability Index (NDI) scores compared with the medication group ($P < 0.01$).[7] Beyond cervicogenic headache, Tuina has also been increasingly applied to other headache subtypes, such as tension-type headache and migraine, with accumulating evidence supporting its efficacy in reducing headache intensity and frequency.[6] This broad applicability highlights the potential of Tuina as a versatile non-pharmacological intervention for headache management.

The combined application of Tuian therapy with acupuncture and moxibustion can produce a synergistic effect. Tuian therapy mainly exerts mechanical stimulation on the cervical vertebrae and the surrounding soft tissues, relieving muscle spasms, correcting joint dislocation, and improving local blood circulation, thereby alleviating nerve root compression and inflammatory reactions caused by cervical mechanical imbalance.[8] Acupuncture stimulates specific acupoints to regulate the release of neurotransmitters (such as serotonin, norepinephrine, and β-endorphin), activate the endogenous pain relief pathway, and simultaneously inhibit the transmission of pain signals.[9] Moxibustion uses warm thermal stimulation on the local acupoints to promote blood vessel dilation, increase blood flow, accelerate the clearance of inflammatory factors, and exert a persistent analgesic effect by regulating the neural-endocrine-immune network.[10] Thus, the target points and mechanisms of action of acupuncture, moxibustion, and Tuian therapy are complementary: Tuian therapy focuses on improving the mechanical structure and local circulation of the cervical vertebrae, acupuncture focuses on central nervous regulation and neurotransmitter regulation, and moxibustion exerts dual local and systemic regulatory effects through the warm thermal effect. The combined application of these three methods may achieve superior clinical efficacy compared to a single therapy through the integration of multiple pathways: "mechanical correction - neural regulation - warm thermal synergy". In recent years, studies on the treatment of cervicogenic headache using Tuina combined with different methods have increased, and it has become a hot topic in clinical research.

However, there are still some limitations of tuina therapy. First, there are differences in the efficacy of different tuina techniques. Secondly, the dose-effect relationship of tuina therapy has not been fully clarified.[11] In addition, the safety of Tuina therapy still needs to be verified by more high-quality studies, especially for patients with severe cervical spine lesions. Therefore, network meta-analysis of tuina combined with different methods in the treatment of cervicogenic headache can not only fill the evidence gap of existing studies, but also provide more accurate treatment guidance for clinical practice. In clinical practice, Tuina therapy is often used in combination with other treatments, but the efficacy of different combination schemes

remains undetermined. Most existing studies are limited to the evaluation of the efficacy of a single combination scheme, lacking systematic comparisons of different combined treatment schemes. Network Meta-analysis can integrate direct and indirect evidence, rank the efficacy of various interventions, and provide methodological support for identifying the optimal combined treatment scheme. Therefore, this study aims to systematically evaluate the differences in efficacy of Tuina therapy combined with different methods in the treatment of cervicogenic headache, with the intention of providing evidence-based guidance for clinical selection of the optimal combined treatment scheme.

# Methods

## Register

This study has been registered with PROSPEO (https://www.crd.york.ac.uk/PROSPERO/view/CRD420251229075).

## Literature Search

PubMed, Web of Science, Embase, Cochrane Library, CNKI, VIP, Wanfang and SinoMed were searched for randomized controlled trials (RCTS) of Tuina in the treatment of cervicogenic headache. The search was performed by combining subject headings with free words. The time period was from the establishment of the database to November 11, 2025 (Supplementary Material: Table 1–4).

### Inclusion Criteria

Population: Patients who met the diagnostic criteria for cervicogenic headache. Since the diagnostic criteria used in the included studies were not the same, patients who met the diagnostic criteria of cervicogenic headache could be included as long as they were clearly stated (The main diagnostic criteria used were those of Sjasstad O (1990 or 1998)).[12,13] Patients' age, gender and course of disease were not limited.

Intervention: the observation group was treated with Tuina combined with other treatment methods (such as acupuncture, traditional Chinese medicine, suspension exercise, etc).

Control group: using Tuina (consistent with the Tuina of the observation group).

Outcome indicators: Refer to the Sjaastad diagnostic criteria: "Cure" is defined as the disappearance of headache symptoms, no recurrence during the follow-up period, and normalization of neck movement; "marked effect" is defined as a significant reduction in headache severity (a decrease of ≥50% or ≥2/3 in the visual analogue scale), a reduction of ≥2/3 in the frequency of headache attacks, and a significant improvement in neck movement; "effective" is defined as a reduction in headache severity (a decrease of ≥30% in the visual analogue scale), a reduction in the frequency of headache attacks, and some improvement in neck movement; "ineffective" is defined as no significant improvement in headache severity, or a decrease in the visual analogue scale score of <30%. Effective rate = cure + marked effect + effective / total number * 100%.; Visual Analog Scales (VAS) score.[14]

### Exclusion Criteria

Non-randomized controlled trials; inconsistent intervention measures; incomplete or erroneous data; inaccessible literature; inability to form a network meta-analysis.

## Risk of Bias Assessment

The risk of bias was assessed using the Cochrane RoB2 tool.[15] Two investigators independently evaluated five domains: randomization process, deviations from intended interventions, missing outcome data, outcome measurement, and selective reporting. Each domain was rated as low risk, some concerns, or high risk. The overall risk of bias was determined as low risk if all domains were low risk, some concerns if at least one domain had some concerns but no high risk, and high risk if any domain was rated high risk. Disagreements were resolved through discussion or consultation with a third reviewer.


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## Literature Screening and Data Extraction

Two researchers independently screened the literature using Endnote. After duplicate checking, reading title and abstract for preliminary screening, and then reading the full text for re-screening, the included studies were determined. Microsoft Excel (Microsoft Corp., Redmond, WA, USA) was used to enter the data. The extracted contents included ① basic information: author, journal, region, and publication year. ② Baseline data: patient information, interventions, treatment course, and outcome indicators. ③ Risk of bias information: randomized method, allocation concealment, blinding, etc. The authors of the original study were contacted for detailed data if the data were incomplete. In cases of incomplete data, the original study authors were contacted. After extraction, two investigators independently cross-checked all data. Disagreements were resolved by discussion or consultation with a third reviewer.

## Statistical Analysis

Meta-analysis was performed using Stata 16.0 and R 4.5.2. For dichotomous outcomes, relative risk (RR) was applied, while for continuous outcomes, mean difference (MD) was utilized, both with corresponding 95% credibility intervals (CI). Heterogeneity was assessed using the $I^2$ statistic, with $I^2<50\%$ indicating no significant statistical heterogeneity, and $I^2 \geq 50\%$ suggesting the presence of statistical heterogeneity, in which case sensitivity analysis was conducted to explore potential sources. Evidence network diagrams were plotted for all outcome indicators. When closed loops were detected in the network, inconsistency was tested. If the P-value exceeded 0.05, a consistency model was adopted; if $P < 0.05$, inconsistency was reported and further examined using the node-splitting method. Treatment rankings were summarized using the surface under the cumulative ranking curve (SUCRA), expressed as a percentage. A higher SUCRA value indicates a more favorable intervention. For outcome indicators involving 10 or more studies, comparison-corrected funnel plots were generated, and publication bias along with small-study effects were assessed. Meta-regression analysis was performed to investigate potential factors influencing the results.

## Quality of Evidence Evaluation

The quality of evidence was assessed using CINeMA.[16] CINeMA graded the quality of evidence from six domains, namely intra-study bias, inter-study bias, indirectness, imprecision, heterogeneity and inconsistency. The final evidence quality level was divided into high, medium and high. Low and very low quality of evidence.

# Results

## Study Selection

A total of 2399 articles were retrieved, and 25 studies were finally included after screening. Figure 1 is the screening flow chart.

## Study Characteristics

Twenty-five studies[17–41] with a total of 2559 patients (1522 in the experimental group and 1037 in the control group) were included in this study. There were 11 kinds of interventions in the experimental group: acupotomology and Tuina, Chinese medicine and Tuina, acupuncture and ultrashort wave and Tuina, Magnetic needle and tuina, silver needle and tuina, acupuncture and tuina, blade needle and tuina, traction and tuina, acupuncture and tuina, suspension motion and tuina, instrument-assisted soft tissue loosening and tuina. Table 1 presents the basic characteristics of the included studies.

# Risk of Bias Instudies

In the field of randomization process, 14 studies (56%) were evaluated as low-risk (clearly described the method for generating random sequences and adopted appropriate allocation concealment measures), 8 studies (32%) were considered to have some risk (only mentioned “random” but did not specify the specific method), and 1 study (4%) was classified as high-risk (adopted non-random grouping methods). Two reported allocation concealment, and one used blinding. All studies had complete data, and no selective reporting and other sources of publication bias were found. The risk of bias assessment showed moderate overall quality, with 24 studies rated as “moderate risk” (96%) and 1 as “low risk” (4%) (Figure 2).

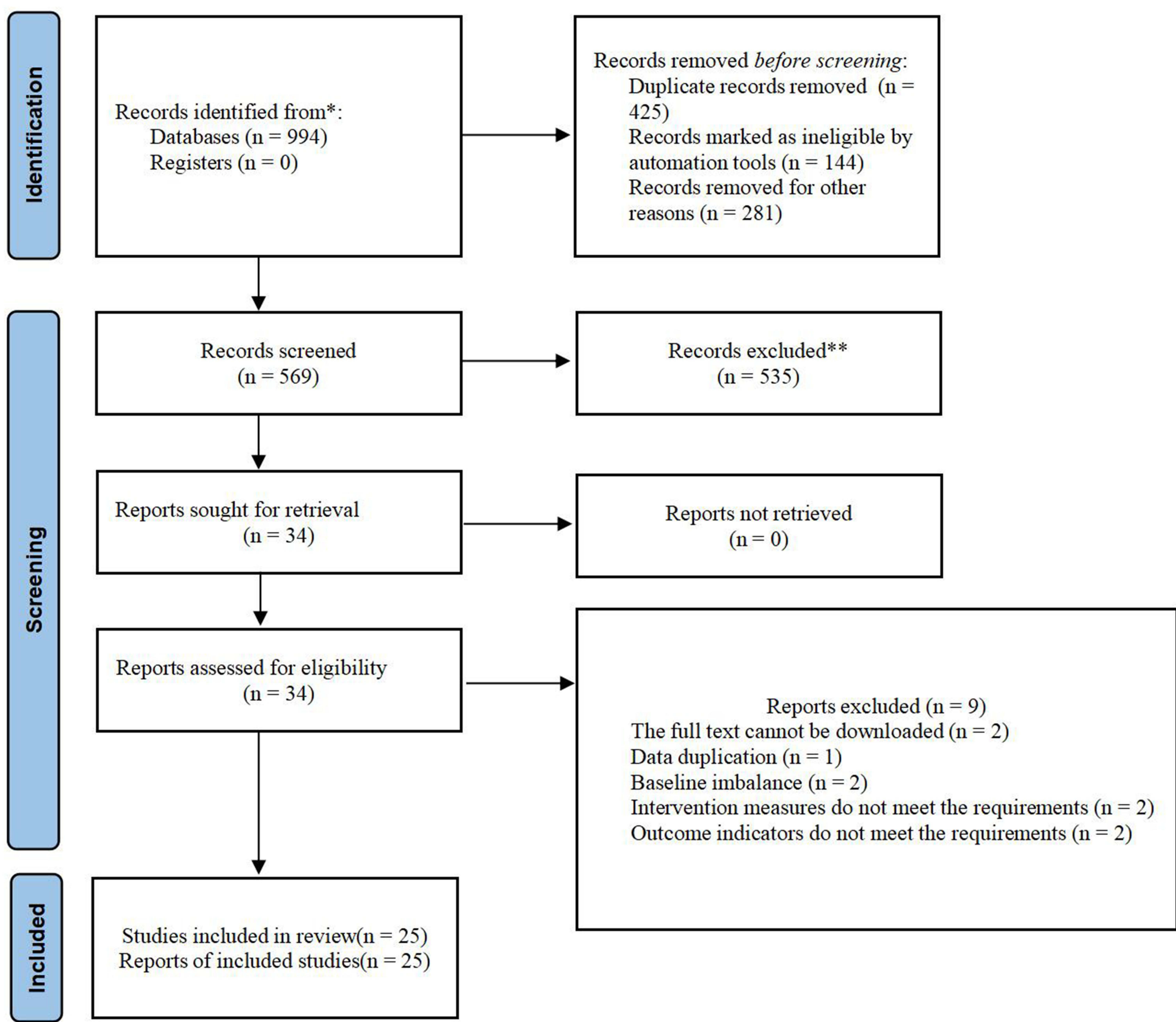


**Figure 1** Study screening flowchart (*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers. **If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.).

# Meta-Analysis

## Efficacy

Twenty-three studies reported the Efficacy. The experimental group included 10 treatment methods. The network graph did not have a closed loop. The consistency model analysis was used (Figure 3). The heterogeneity test results showed that I2 = 1%. The results of the network meta-analysis showed that compared with Tuina, Acupuncture and Moxibustion and Tuina, Suspended Exercise and Tuina, Acupotomy and Tuina, Chinese Medicine and Tuina, Acupuncture and Tuina, Blade Needle and Tuina, Traction and Tuina had significant advantages ($P < 0.05$) (Figure 4). There was no significant difference in the effects among the various intervention measures (Supplementary Material: Table 5). The SUCRA ranking of the top three was: Blade Needle and Tuina (0.89), Acupotomy and Tuina (0.81), Acupuncture and Moxibustion and Tuina (0.67) (Table 2). To evaluate the impact of diagnostic standard heterogeneity on the robustness of the results, we conducted a sensitivity analysis based on the diagnostic criteria as the grouping basis. Among the 23 included studies, 16 used the diagnostic criteria proposed by Sjaastad et al for cervical origin headache, and other diagnostic criteria were few and insufficient to support independent subgroup analysis. We will use the Sjaastad standard as the data set for the sensitivity analysis and re-perform the network Meta-analysis. The results of

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**Table 1** The Basic Characteristics Included in the Study

| Author | Year | Diagnostic Criteria | Intervention | | Samplesize | | Time | Outcomes |
|---|---|---|---|---|---|---|---|---|
| | | | Intervention Group | Control Group | Intervention Group | Control Group | | |
| Yaoxm[17] | 2007 | Sjasstad O | 2 and 1 | 1 | 80 | 80 | 21d | Efficacy |
| Zhousj[18] | 2011 | Diagnosis and Treatment of Cervical Pain Disorders | 3 and 1 | 1 | 60 | 60 | 10d | Efficacy, VAS |
| Yangn[19] | 2012 | Minutes of the Second National Symposium on Cervical Spondylosis | 4 and 5 and 1 | 1 | 36 | 36 | 16d | Efficacy |
| Sunsg[20] | 2013 | Sjasstad O | 3 and 1 | 1 | 45 | 45 | 28d | Efficacy, VAS |
| Yuanhh[21] | 2015 | Sjasstad O | 6 and 1 | 1 | 98 | 100 | 10d | Efficacy |
| Chenlb[22] | 2016 | Sjasstad O | 7 and 1 | 1 | 50 | 50 | 11d | VAS, Efficacy |
| Tianhb[23] | 2016 | Sjasstad O | 2 and 1 | 1 | 63 | 63 | 13d | Efficacy |
| Dum[24] | 2018 | Sjasstad O | 4 and 1 | 1 | 50 | 50 | 28d | Efficacy |
| Wanglx[25] | 2018 | Sjasstad O | 4 and 1 | 1 | 84 | 84 | 28d | Efficacy |
| Chenxl[26] | 2019 | | 8 and 1 | 1 | 55 | 55 | 14d | VAS, Efficacy |
| Huh[27] | 2019 | Sjasstad O | 9 and 1 | 1 | 52 | 52 | 28d | Efficacy, VAS |
| Linb[28] | 2019 | Sjasstad O | 4 and 1 | 1 | 32 | 32 | 10d | Efficacy, VAS |
| Taol[29] | 2019 | Diagnosis and Treatment of Cervical Pain Disorders | 10 and 1 | 1 | 60 | 60 | 28d | Efficacy, VAS |
| Zhangyj[30] | 2019 | Diagnosis and Treatment of Cervical Pain Disorders | 10 and 1 | 1 | 50 | 50 | 30d | Efficacy, VAS |
| Liyl[31] | 2020 | | 4 and 1 | 1 | 50 | 50 | 28d | Efficacy |
| Yaocl[32] | 2020 | | 4 and 1 | 1 | 55 | 55 | 30d | Efficacy, AE |
| Linbq[33] | 2021 | Sjasstad O | 11 and 1 | 1 | 60 | 60 | 10d | Efficacy, VAS |
| Wang[34] | 2021 | | 4 and 1 | 1 | 44 | 44 | 10d | Efficacy, VAS |
| Linglx[35] | 2021 | Sjasstad O | 11 and 1 | 1 | 40 | 40 | 28d | Efficacy, VAS |
| Xiaxf[36] | 2021 | Chinese Expert Consensus on Pain Management | 10 and 1 | 1 | 60 | 60 | 30d | Efficacy |
| Xufh[37] | 2021 | | 4 and 1 | 1 | 240 | 240 | 10d | Efficacy, VAS |
| Zhaowd[38] | 2021 | Sjasstad O | 3 and 1 | 1 | 56 | 56 | 14d | Efficacy |
| Liulj[39] | 2023 | Sjasstad O | 4 and 1 | 1 | 30 | 30 | 14d | VAS |
| Yangjl[40] | 2023 | Sjasstad O | 4 and 1 | 1 | 40 | 40 | 30d | Efficacy, VAS |
| Gopal Nambi[41] | 2024 | Sjasstad O | 12 and 1 | 1 | 32 | 32 | 28d | VAS |

**Notes**: 1: Tuina, 2: Acupotomy, 3: Chinese medicine, 4: Acupuncture, 5: Ultrashort wave, 6: Magnet needle, 7: Silver needle, 8: Blade needle, 9: Traction, 10: Acupuncture and moxibustion, 11: Suspended exercise, 12: Instrument-assisted soft tissue mobilization.

the sensitivity analysis showed that in terms of efficacy, compared with simple Tuina, Acupotomy and Tuina (RR = 1.41, 95% CI: 1.17, 1.70), Acupuncture and Tuina (RR = 1.28, 95% CI: 1.06, 1.55) and other intervention measures still showed significant advantages. The SUCRA probability ranking showed that the top three intervention measures were: Acupotomy and Tuina (0.86), Acupuncture and Tuina (0.66), and Traction and Tuina (0.64). Compared with the overall analysis, although the ranking details were different, the core intervention measures such as Acupotomy and Tuina, Acupuncture and Tuina still ranked at the top, indicating that the differences in diagnostic criteria did not have a decisive impact on the core conclusion, and the research results had good robustness (Table 2).

## VAS

Fifteen studies reported VAS, and the experimental group included 8 treatment methods. The network graph did not have a closed loop. The consistency model analysis was used (Figure 5). The heterogeneity test results showed that I2 = 5%. The results of the network meta-analysis showed that compared with Tuina, Acupuncture and Moxibustion and Tuina, Acupuncture and Tuina, Blade Needle and Tuina had significant advantages ($P < 0.05$) (Figure 6). There was no significant difference in the effects among the various intervention measures (Supplementary Materials: Table 6). The top three ranked by SUCRA were: Blade Needle and Tuina (0.81), Acupuncture and Tuina (0.72), and Acupuncture and Moxibustion and Tuina (0.71) (Table 2). Sensitivity analysis was conducted using 12 studies (reporting VAS scores) following the Sjaastad standard. The results showed that compared with simple Tuina, intervention measures such as

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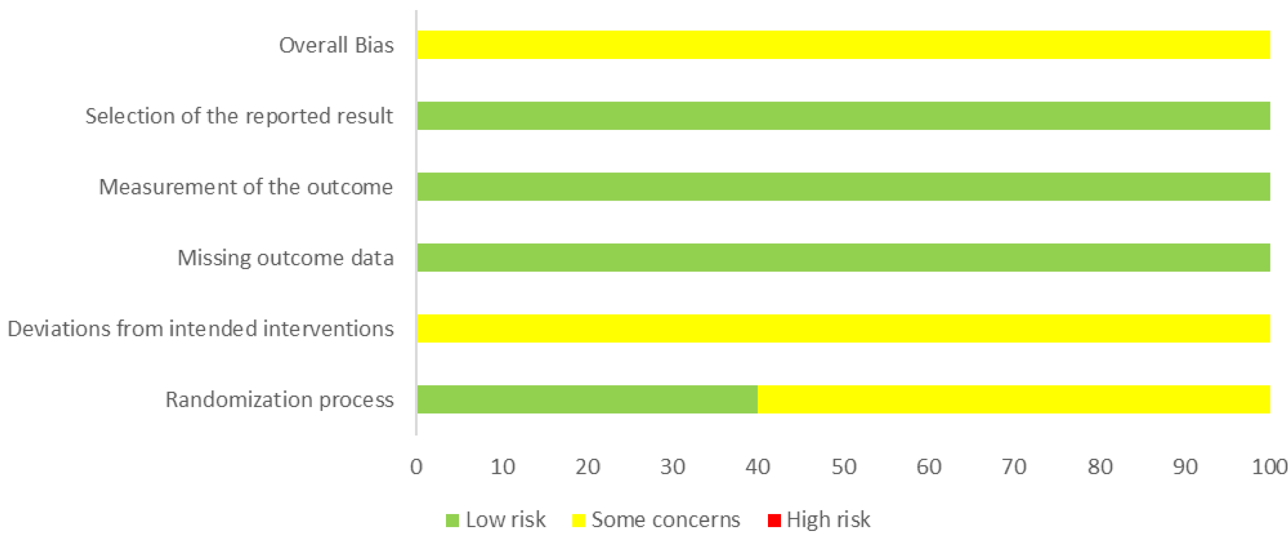


**Figure 2** Risk of bias assessment summary for the included studies.

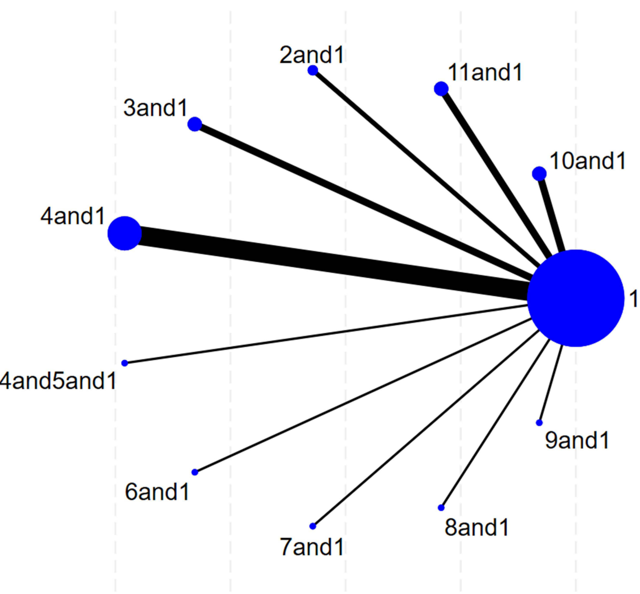


**Figure 3** Network plot of eligible comparisons for the outcome of Efficacy.

Acupuncture and Tuina (MD = -1.44, 95% CI: -1.99, -0.89) still showed significant advantages. The SUCRA probability ranking results showed that the top three intervention measures were: Acupuncture and Tuina (0.85), Instrument-assisted soft tissue mobilization and Tuina (0.71), and Traction and Tuina (0.52). The results of the sensitivity analysis were basically consistent with the overall analysis. Acupuncture and Tuina ranked at the top in both analyses, further supporting the stable efficacy of this intervention measure (Table 2).

It should be particularly noted that the SUCRA ranking only reflects the probability ranking and does not represent a definitive conclusion on the superiority or inferiority of the efficacy. Although Blade Needle and Tuina ranked first in the efficiency ranking, it was based on a small sample study, and the evidence quality was low, and its ranking result should be interpreted with caution. In contrast, Acupuncture and Tuina ranked slightly lower, but the evidence volume was more substantial, and the results were relatively more reliable.


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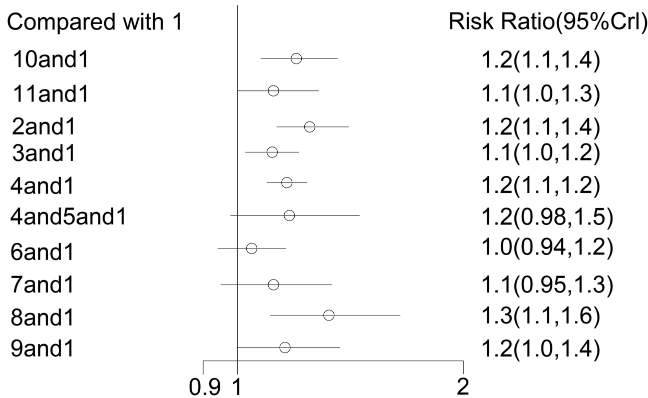


**Figure 4** Forest plot of eligible comparisons for the outcome of Efficacy.

## Analysis of Publication Bias

The funnel plot test results indicated that there was a relatively low possibility of publication bias for the efficacy rate (P = 0.11), but a relatively high possibility of publication bias for VAS (P = 0.04), suggesting that there might be publication bias in the pain improvement indicators. Therefore, the interpretation of VAS-related results should be more cautious (Figures 7 and 8).

## Sensitivity Analysis and Meta-Regression

Sensitivity analysis of the results was performed and the results were found to be stable and reliable (Supplementary material: Figures 1–4). Meta-regression was performed and it was found that the duration of treatment had an impact on the efficacy of some interventions. In terms of improving the total effective rate, compared with Tuina, the curative effect of Tuina combined with Acupotomy was positively proportional to the course of treatment (RR=2.84, 95%CI=1.51,4.60). In terms of pain relief, compared with Tuina, the therapeutic effect of Tuina combined with Acupuncture was positively proportional to the course of treatment (MD=-2.22, 95%CI=-4.08,-0.42), and there was no significant relationship between the therapeutic effect of other interventions and the course of treatment.

**Table 2** SUCRA Ranking

| Intervening Measure | Efficacy | | | VAS | | |
|---|---|---|---|---|---|---|
| | SUCRA | RR (95%CI) | Rank | SUCRA | MD (95%CI) | Rank |
| 1 | 0.03 | 1 | 11 | 0.08 | 0 | 9 |
| 10 and 1 | 0.67 | 1.19 (1.07, 1.36) | 3 | 0.71 | −2.13 (-3.87, -0.38) | 3 |
| 11 and 1 | 0.42 | 1.12 (1, 1.28) | 8 | 0.40 | −1.05 (-2.73, 0.64) | 6 |
| 12 and 1 | – | – | – | 0.67 | −2 (-4.34, 0.36) | 4 |
| 2 and 1 | 0.81 | 1.25 (1.12, 1.4) | 2 | – | – | – |
| 3 and 1 | 0.36 | 1.1 (1.02, 1.2) | 9 | 0.26 | −0.59 (-2.26, 1.07) | 8 |
| 4 and 1 | 0.57 | 1.16 (1.1, 1.23) | 5 | 0.72 | −2.1 (-3.34, -0.95) | 2 |
| 4 and 5 and 1 | 0.58 | 1.17 (0.98, 1.45) | 4 | – | – | – |
| 6 and 1 | 0.17 | 1.04 (0.94, 1.16) | 10 | – | – | – |
| 7 and 1 | 0.43 | 1.12 (0.95, 1.33) | 7 | 0.36 | −0.9 (-3.25, 1.45) | 7 |
| 8 and 1 | 0.89 | 1.32 (1.11, 1.63) | 1 | 0.81 | −2.58 (-4.95, -0.2) | 1 |
| 9 and 1 | 0.54 | 1.15 (1, 1.37) | 6 | 0.45 | −1.22 (-3.65, 1.21) | 5 |

**Notes**: 1: Tuina, 2: Acupotomy, 3: Chinese medicine, 4: Acupuncture, 5: Ultrashort wave, 6: Magnet needle, 7: Silver needle, 8: Blade needle, 9: Traction, 10: Acupuncture and moxibustion, 11: Suspended exercise, 12: Instrument-assisted soft tissue mobilization.

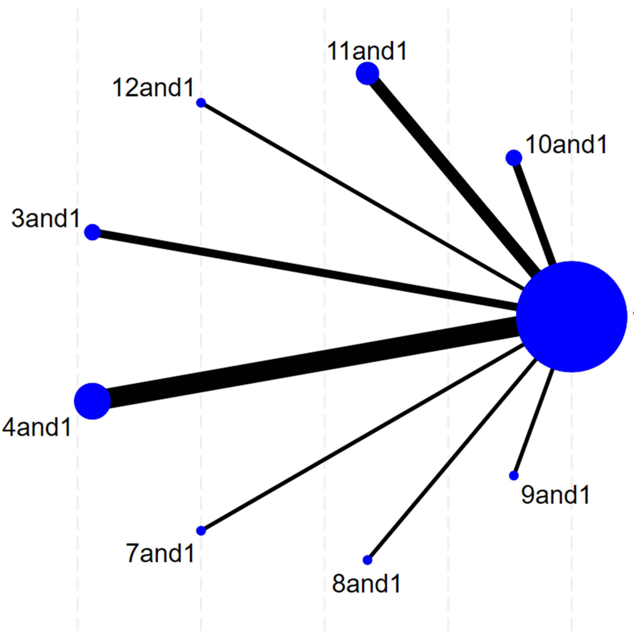


**Figure 5** Network plot of eligible comparisons for the outcome of VAS.

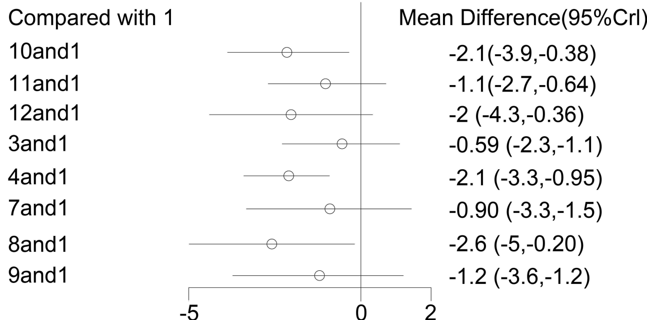


**Figure 6** Forest plot of eligible comparisons for the outcome of VAS.

## Quality of Evidence Evaluation

CINeMA was used for quality of evidence assessment. There were 18 pieces of evidence, showing that 0 (0%) of evidence was of high quality, 12 (66%) of evidence was of medium quality, and 6 (34%) of evidence was of low quality. The main reason for downgrade was heterogeneity among studies (Supplementary material: Table 7).

# Discussion

## Summary of Evidence

A total of 25 studies were included in this research, involving 11 Tuina combined treatment protocols. The CINeMA evidence quality assessment revealed that the majority of the evidence was of moderate to low quality, with only 0% being of high quality. This finding highlights the core issue in the current research field: the evidence base for Tuina combined treatment of cervicogenic headache is generally weak. The network Meta-analysis results showed that there were differences in the ranking of each combined treatment protocol on different efficacy indicators. After considering the robustness of the evidence, the number of studies, and clinical feasibility, Acupuncture and Tuina performed stably in two indicators: the effective rate SUCRA ranked fourth in the overall analysis (0.62), and rose to the second place in the sensitivity analysis (0.66); the VAS score ranked second in the overall analysis (0.72), and first in the sensitivity analysis (0.85). This protocol had a large number of studies (6–7), sufficient evidence volume, and the sensitivity analysis


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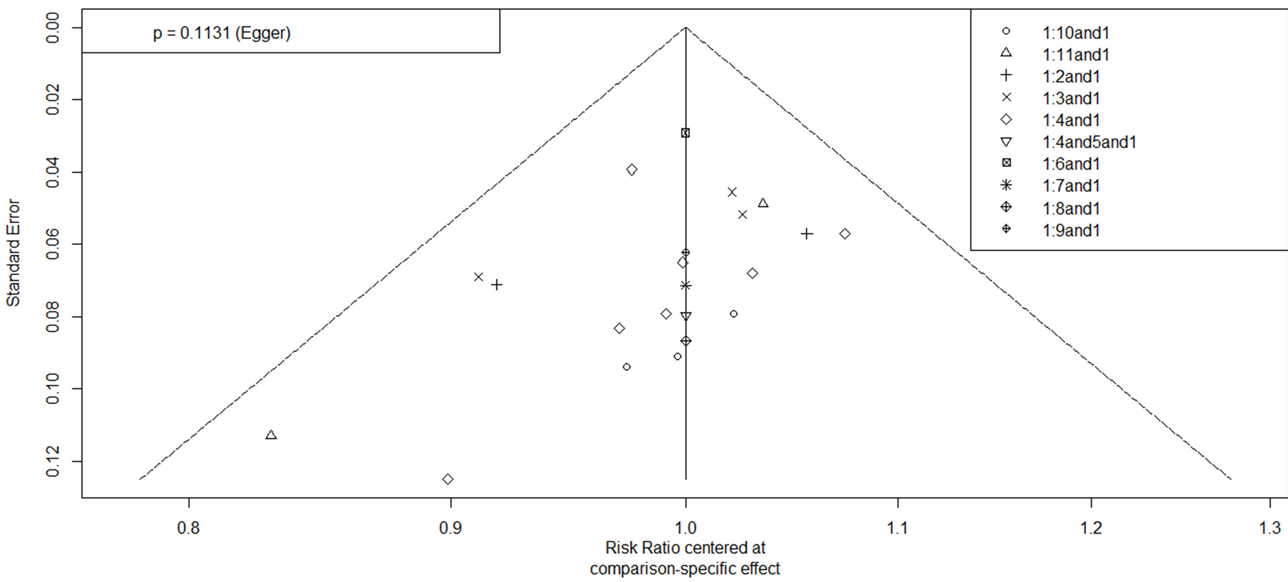


**Figure 7** Funnel plot for the assessment of publication bias (Efficacy).

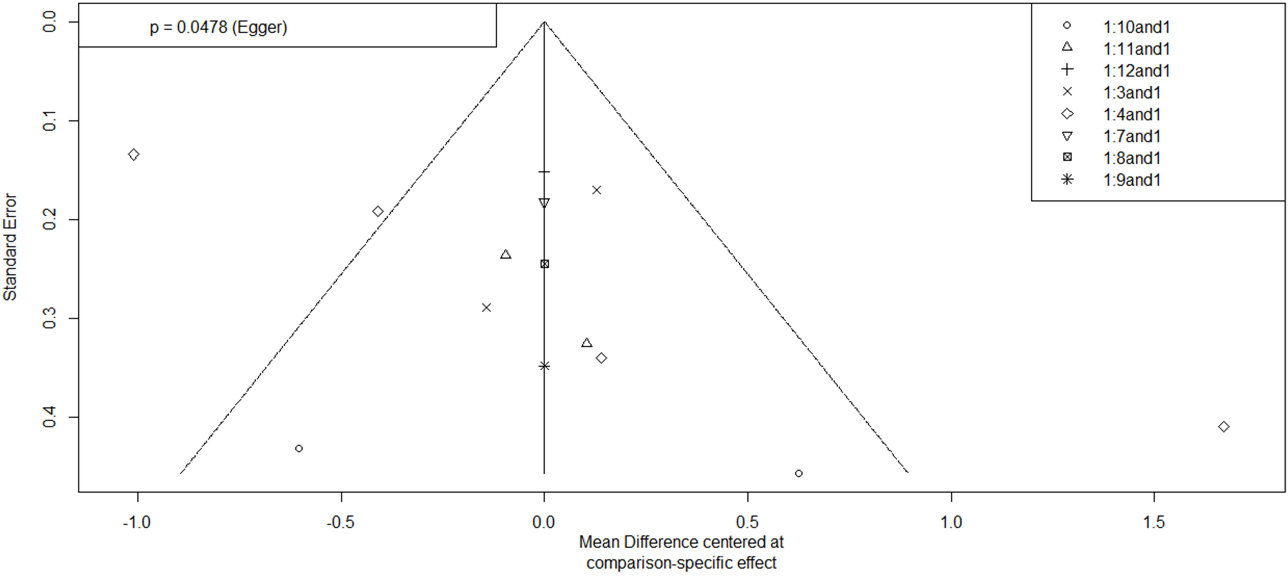


**Figure 8** Funnel plot for the assessment of publication bias (VAS).

confirmed its stability of ranking, suggesting a relatively reliable conclusion. Acupotomy and Tuina performed well in the effective rate aspect (sensitivity analysis SUCRA = 0.86), but the number of related studies was small (2–3), and the evidence base was relatively weak. More high-quality studies are still needed for verification. Blade needle and Tuina ranked highest in the overall analysis, but only one study supported it, and the evidence strength was insufficient, and the conclusion should be interpreted with caution. In summary, Acupuncture and Tuina may be the best intervention measure. The reasons are as follows: (1) In the overall analysis and sensitivity analysis, Acupuncture and Tuina were stably ranked in the top three in both indicators (effective rate and VAS), being the only intervention measure that maintained a stable ranking in all analyses. (2) The evidence volume was the largest: the number of studies related to

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Acupuncture and Tuina was the largest, the total sample size was the largest, and the statistical power was higher, making the conclusion more reliable. The two measures, acupuncture and Tuina, are both mature clinical techniques with clear operation norms and high patient acceptance and safety. (3) The effect size was reliable: in the VAS score, Acupuncture and Tuina ranked first in the sensitivity analysis (SUCRA = 0.85), indicating its prominent analgesic effect. The core value of this study is not to provide a definitive conclusion on the "best protocol", but to systematically reveal which protocols have received more research support and which ones are still in the blank state. This finding points out the key direction for future research: more high-quality studies should be conducted for those protocols with weak evidence bases but potential, and head-to-head comparisons of different combined protocols should be strengthened to build a closed evidence network.

## Summary of Clinical Evidence

The mechanism of acupuncture in the treatment of CGH involves multiple levels, including regulating the level of neurotransmitters, improving local blood circulation, and relieving muscle tension. Studies have shown that acupuncture can regulate the release of neurotransmitters such as 5-hydroxytryptamine and norepinephrine by stimulating specific acupoints, so as to exert analgesic effects. At the same time, acupuncture can also promote local blood vessel expansion, increase blood flow and improve tissue hypoxia, which provides a physiological basis for relieving headache.[41] In addition, the relaxing effect of acupuncture on the neck muscles can also help to reduce the headache symptoms caused by muscle tension. A large number of randomized controlled trials have confirmed the effectiveness of acupuncture in the treatment of CGH. Compared with medication, acupuncture can not only significantly reduce the frequency and intensity of headache attacks, but also reduce the dosage of medication, thereby reducing the incidence of drug side effects. Compared with physical therapy, acupuncture treatment has a longer lasting effect and higher patient compliance. It is worth noting that the safety of acupuncture treatment has also been widely recognized, and the incidence of serious adverse reactions is extremely low. Compared with other therapies, acupuncture has unique advantages in the treatment of CGH. First of all, acupuncture is a non-invasive treatment method, which avoids the risk of invasive treatment such as surgery. Secondly, acupuncture treatment has the characteristics of individualization, and different acupoints and acupuncture manipulations can be selected according to the specific conditions of patients to achieve precise treatment. In addition, the cost of acupuncture treatment is relatively low and has high economic benefits. Most importantly, acupuncture therapy can not only relieve symptoms, but also achieve the effect of treating both symptoms and root causes by regulating the overall function of the body, which provides a new idea for the long-term management of CGH.

The neuromodulation mechanism of Tuina in the treatment of CGH mainly involves mechanical stimulation of the cervical spine and its surrounding soft tissues through manipulation. This stimulation can activate neurons in the spinal dorsal horn, regulate pain transduction pathways in the central nervous system, and promote local blood circulation and the clearance of inflammatory mediators. Studies have shown that tuina manipulation can significantly reduce the levels of pain mediators such as substance P and calcitonin gene-related peptide, and increase the release of endogenous analgesic substances such as β-endorphin, so as to achieve multi-level pain regulation. A number of randomized controlled trials have provided strong evidence for this. Xu et al 's network Meta-analysis[42] showed that cervical manipulation (CSM) had the most outstanding performance in reducing pain in the short term, and its probability of cumulative area under the ranking curve (SUCRA) was as high as 98.9%, which was significantly better than other interventions. For the improvement of neck disability index (NDI), CSM also showed significant advantages (SUCRA=82.2%). Of particular note, the continuous natural glide (SNAG) maneuver showed sustained efficacy in the long-term follow-up, with a significantly better improvement in visual analogue scale (VAS) score than the non-SNAG intervention (MD=1.73, 95%CI: 1.05, 2.40), and this improvement was reflected in neck function and quality of life indicators. The unique advantages of tuina therapy are not only reflected in its significant clinical efficacy, but also in its good safety and maneuverability. Compared with drug therapy, Tuinatherapy avoids the risk of drug dependence and adverse reactions; Compared with surgical treatment, it has less trauma and faster recovery. In addition, Tuinatherapy can be individually adjusted according to the specific situation of the patient, and it can improve the range of motion of the cervical spine and the overall functional status while improving the pain. This comprehensive treatment feature makes it of great application value in the clinical management of cervicogenic headache. Acupuncture combined with tuina

therapy can improve neck hemodynamics. The analysis of the reason is that the important structure in the deep layer of Fengchi is mainly the vertebral artery. Acupuncture and moxibustion has a direct thermal effect through warm stimulation, which can accelerate the blood circulation of the surrounding tissues, promote the circulation and metabolism of lymph, relieve the spasm of the vertebral artery, and restore blood supply.

The results of Meta regression showed that the therapeutic effect of Tuina combined with Acupotomy and Tuina combined with Acupuncture was proportional to the course of treatment. Acupuncture plays a role by regulating the release of neurotransmitters and improving local microcirculation, while tuina therapy focuses on releasing muscle spasms and correcting joint malposition. The two intervention modalities need enough time to produce a synergistic effect. Short-term treatment often only provides relief of acute symptoms, and achieving long-term efficacy usually requires continuous intervention for 4–6 weeks. Insufficient courses of treatment may lead to difficult consolidation of treatment effects and patients are prone to relapse. However, too long treatment course may lead to a waste of medical resources and even lead to acupuncture tolerance. Individual differences in different patients (such as the duration of disease, the degree of pain, and the physical characteristics) may affect the determination of the optimal treatment course. Therefore, the key to improve the therapeutic effect of acupuncture combined withTuinais to formulate an individualized treatment plan and adjust it in time according to the treatment response. Acupotomy can quickly relieve pain by releasing local soft tissue adhesion and decompression, whileTuinafocuses on the adjustment of overall mechanical balance. The two synergistically act on the core pathological link of cervical spine biomechanical imbalance. The significant analgesic effect can be produced within 3–5 days after acupotome intervention, and the reconstruction of deep muscle group coordination byTuinaoften takes 2–3 weeks to appear. The effect of the same course of treatment can vary by 30–40% in different patients. Premature termination of the treatment may lead to incomplete correction of the muscle compensation pattern, and excessive extension of the acupotomectomy treatment may increase the risk of local tissue trauma. The minimally invasive effect of acupotomectomy activates the local repair mechanism (lasting 7–10 days), which is time-coupled with the onset period of theTuinaintervention. It is suggested that the timing matching of the biological effects of the two therapies should be fully considered in the course of treatment design.[43]

## Strengths and Limitations

This study is the first to systematically summarize the evidence of Tuina combined with other methods for treating cervicogenic headache, providing clinical evidence-based support. However, this study also has the following limitations, among which the challenge of the transitivity assumption is the most core methodological issue. (1) The challenge of the transitivity assumption: The core assumption of the network meta-analysis - transitivity - faces a severe challenge in this study. The transitivity assumption requires that simple Tuina should be comparable in all included studies, that is, the Tuina used as the common comparator should be similar across different studies. However, there are significant differences in Tuina techniques in clinical practice, including manipulation types (pinching, pressing, kneading, repositioning techniques, etc), operation sites, treatment frequency, single treatment duration, and therapist qualifications, etc. This internal variability of the intervention measures makes "Tuina" not a homogeneous comparator, which may affect the establishment of the transitivity assumption and reduce the reliability of the indirect comparison results. To minimize the impact of this issue, we took the following measures: ① In the inclusion criteria, only studies with Tuina as the control were included to ensure consistent comparison benchmarks; ② Through sensitivity analysis to test the changes in results after excluding specific Tuina technique studies; ③ In the conclusion, we maintained cautious expression, emphasizing the current low quality of evidence. However, these measures cannot fundamentally solve the inherent problems of the transitivity assumption. Future research should follow international reporting norms such as STRICTA to detail the specific operational details of Tuina intervention, so as to conduct subgroup analysis based on Tuina technique types and further verify the rationality of the transitivity assumption. (2) Network structure limitations and inconsistency test absence: The evidence network of this study has a star-shaped structure, and all combined treatment plans are directly compared with simple Tuina, but there is a lack of head-to-head comparisons among different combined treatment plans. This network structure makes it impossible to test inconsistency using the node splitting method, and the verification of model assumptions mainly relies on clinical similarity judgment and sensitivity analysis. In this context, the ranking results of this study are entirely based on indirect comparison, and their reliability is relatively limited, should be regarded as "exploratory" findings rather than definitive conclusions. Future studies need to conduct

head-to-head comparison studies of different combined treatment plans to construct a closed evidence network. (3) Interpretation of low heterogeneity: The statistical heterogeneity of this study is low (efficacy $I^2 = 1\%$, VAS $I^2 = 5\%$), but this result should not be interpreted as evidence of clinical homogeneity. Low statistical heterogeneity may be due to the setting of common control groups, consistency of effect direction, and the limited number of included studies. Clinical heterogeneity (variations in Tuina technique, treatment frequency, treatment duration, diagnostic criteria, etc) still exists and is considered as a downgrade factor in the CINeMA evidence quality evaluation. (4) Inconsistent intervention measures: The reports of Tuina techniques in the included studies are generally insufficient. Most studies only vaguely mention "Tuina treatment", without specifying the specific manipulation type, operation parameters, and operator qualifications, resulting in significant heterogeneity in the definition of the intervention measures, and also limiting the subgroup analysis based on Tuina technique types. The treatment courses of the included studies are generally short. More than half of the studies have a course of only 10–14 days, while cervicogenic headache is a chronic disease, and its efficacy evaluation requires a longer observation period. Short-term studies may overestimate short-term efficacy but cannot reflect the persistence of long-term recurrence rate and functional improvement. The meta-regression results showed that the efficacy of Tuina combined with knife acupuncture and Tuina combined with acupuncture was proportional to the treatment duration, suggesting that short-term studies might underestimate the true efficacy of some combined treatment regimens. The diagnostic criteria used in the included studies varied. Although the sensitivity analysis indicated that this difference had a limited impact on the core conclusion, the inconsistency in diagnostic criteria could still increase clinical heterogeneity. Based on these limitations, future studies should improve in the following aspects: (1) Standardize the reporting of Tuina intervention details and follow international reporting norms such as STRICTA; (2) Conduct head-to-head comparative studies of different combined treatment regimens to build a closed evidence network; (3) Extend the treatment duration and follow-up time, and recommend observing at least 4–8 weeks to evaluate the persistence of efficacy; (4) Adopt a unified diagnostic standard to improve the comparability among studies.

## Future Research Directions

(1) Conduct direct comparative studies: The current evidence network is in a star-shaped structure, with all studies comparing combined treatment with simple Tuina, lacking direct comparisons among different combined treatment schemes. This pattern prevents us from verifying the reliability of indirect comparisons through the inconsistency test of network meta-analysis. In the future, priority should be given to conducting head-to-head randomized controlled trials among different combined treatment schemes, such as "Acupuncture and Tuina vs Acupotomy and Tuina", to build a closed evidence network and provide more reliable direct evidence for clinical decision-making. (2) Improve research quality: The CINeMA evaluation shows that the quality of the included evidence is generally at the medium to low level. The reasons for the downgrade mainly include internal bias, heterogeneity, and imprecision of the studies. Future research should follow the CONSORT statement and STRICTA standards, standardize the reporting of key methodological details such as randomization methods, allocation concealment, and implementation of blinding, to improve the internal validity of the studies. At the same time, the sample size should be expanded to ensure sufficient statistical power of the studies. (3) Standardize the reporting of Tuina intervention: Most of the studies included in this research report the Tuina technique extremely briefly, merely mentioning "Tuina treatment" without specifying the type of manipulation, operation parameters (force, frequency, duration), and qualifications of the therapist. This not only limits the subgroup analysis based on Tuina technique types but also reduces the clinical reproducibility of the studies. Future research should refer to international reporting norms such as STRICTA to describe the specific operational details of the Tuina intervention in detail. (4) Extend the treatment duration and follow-up time. More than half of the studies have a treatment course of only 10–14 days, while cervical-originated headache is a chronic disease, and its efficacy evaluation requires a longer observation period. Meta-regression results show that the efficacy of some combined treatments is proportional to the treatment course, suggesting that short-term studies may underestimate the true effect of the treatment. Future research should extend the treatment duration (suggested 4–8 weeks) and increase long-term follow-up (such as 3 months, 6 months) to evaluate the persistence and long-term safety of the treatment effect. (5) Adopt a unified diagnostic standard: In the included studies, some use the Sjaastad standard, and some use the ICHD standard. The non-uniformity of the diagnostic standards increases clinical heterogeneity. Future research should uniformly adopt the International

Classification of Headache Disorders (ICHD-3) to improve the comparability between studies. (6) Focus on publication bias: The publication bias test of this study suggests that the VAS indicator may have publication bias, indicating that negative results may not have been published. In the future, it is necessary to encourage the registration of clinical trials and the publication of negative results to reduce the impact of publication bias on evidence integration.

## Conclusions

This study systematically reviewed the existing evidence landscape of Tuina combined with different therapies for cervicogenic headache, including 23 studies and 11 combined treatment regimens. The evidence volume indicates that studies on Acupuncture and Tuina and Tuina combined with acupuncture have a relatively larger number, but their evidence quality is only at the medium level; while Blade needle and Tuina, Acupotomy and Tuina, etc. have only one or a few small sample studies supporting them, and their evidence base is extremely weak. The main limitations of this study are as follows: The transferability assumption is challenged due to the clinical variability of Tuina techniques; the evidence network lacks head-to-head comparisons, making it impossible to test inconsistencies; most studies have short treatment courses, which may underestimate the long-term efficacy. The value of this study lies in revealing the limitations of the current evidence landscape, rather than providing definitive recommendations. In the future, priority should be given to conducting direct comparison studies, standardizing Tuina intervention reports, extending treatment cycles and follow-up times, adopting unified diagnostic criteria, and paying attention to publication bias issues.

## Author Contributions

Zijing Yu is the first author. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## References

1. Clifford G. ain management in patients with cervicogenic headache. *Pain Manag*. 2006;21(10):1–12.
2. Zhengquan F, Haiyong L, Lianzhong G, et al. Efficacy analysis of fire needling combined with Xinyi bone setting in the treatment of cervical headache in adolescents. *Hebei J Trad Chin Med*. 2018;33(4):55–57.
3. Dunning J, Butts R, Zacharko N, et al. Spinal manipulation and perineural electrical dry needling in patients with cervicogenic headache: a multicenter randomized clinical trial. *Spine J*. 2021;21(2):284–295. doi:10.1016/j.spinee2020.10.008
4. Gross AR, Paquin JP, Dupont G, et al. Exercises for mechanical neck disorders: a Cochrane review update. *Man Ther*. 2016:So–45. doi:10.1016/j.math.2016.04.005.
5. Guan LY, Xu T, Wang RQ, et al. Network Meta-analysis of four traditional Chinese medicine external therapies for cervicogenic headache. *J Educ Chang Jiangxi Univ Chin Med*. 2024;36(2):39–45. doi:10.20140/j.2095-7785.2024.02.12
6. Qian X, Ma D, Liu J, et al. Assessment of the efficacy of tuina on treating cervicogenic headache: a protocol for systematic review and meta-analysis. *Medicine*. 2021;100(22):e26224. doi:10.1097/MD.000000000002622
7. N L, Liu J, Zhang M. Clinical observation on tuina therapy for cervicogenic headache. *J Acupunct Tuina Sci*. 2009;7:343–346. doi:10.1007/s11726-009-0343-x
8. Weibin Z, Xinwu Z, Yinghua H, et al. Research progress on the treatment of cervicogenic headache with traditional chinese external therapies. *J Changchun Univ Trad Chin Med*. 2025;41(12):1405–1410. doi:10.13463/j.cnki.cczyy.2025.12.023
9. Liu Q, Qin X, Luo C, et al. Effects of warm needle acupuncture on behavioral pain threshold in a rat model of migraine. *Front Neurol*. 2025;16:1538182. doi:10.3389/fneur.2025.1538182
10. Yonghui F, Lixin F, Siyang Z, et al. Clinical research progress on acupuncture treatment for cervicogenic headache. *China Modern Doctor*. 2025;63(04):114–117.

11. Haas M, Bronfort G, Evans R, et al. Dose-response and efficacy of spinal manipulation for care of cervicogenic headache: a dual-center randomized controlled trial. *Spine J*. 2018;18(10):1741–1754. doi:10.1016/j.spinee2018.02.019
12. Sjasstad O, Fredriksen TA, Pfaffenrath V. Cervicogenic headache:diagnostic criteria. *Headache*. 1990;30(11):725–726. doi:10.1111/j.1526-4610.1990.hed3011725.x
13. Sjaastad O, Fredriksen TA, Pfaffenrath V. Cervicogenic headache:diagnostic criteria. *Headache*. 1998;38(6):442. doi:10.1046/j.1526-4610.1998.3806442.x
14. Faiz KW. VAS–visuell analog skala [VAS--visual analog scale]. *Tidsskr nor Laegeforen*. 2014;134(3):323. doi:10.4045/tidsskr.13.1145
15. Higgins JP, Altman DG, Gøtzsche PC, et al. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*. 2011;343: d5928. doi:10.1136/bmj.d5928
16. Nikolakopoulou A, Higgins JPT, Papakonstantinou T, et al. CINeMA: an approach for assessing confidence in the results of a network meta-analysis. *PLoS Med*. 2020;17:e1003082. doi:10.101371/jounalpmed1003082
17. Xinmiao Y, Yudong C, Quanqing W, et al. Clinical study on acupotomy combined with manipulation in the treatment of cervicogenic headache. *Zhejiang J Integr Trad Chin West Med*. 2007;2007(02):84–85.
18. Shu-juan Z, Yong Y, Hai-song LU. Clinical study of Gujing decoction combined with tuina therapy in the treatment of cervicogenic headache. *J Chin med*. 2011;26(12):1529–1530. doi:10.16368/j.iSSN.1674-8999.2011.12.037
19. Yang N, W YH. Treatment of 36 cases of cervicogenic headache with acupuncture and tuina combined with ultrashortwave wave. *Shaanxi Trad Chin Med*. 2012;33(09):1212–1213.
20. Shaogang S, Xuguang G. Gastrodin tablets combined withTuinain the treatment of 45 cases of cervicogenic headache. *Chin J Exp Formulary*. 2013;19(12):294–296.
21. Haiguang Y, Zhengquan L. Treatment of 98 cases of cervicogenic headache with magnetic pole needle combined with chiropractic Tuina. *Shaanxi Trad Chin Med*. 2015;36(09):1240–1241.
22. Li-bin C, Xiang-dong X, Xiao L. Study on the treatment of cervicogenic headache with silver needle and Tuina. *J Taishan Med College*. 2016;37 (04):369–371.
23. Tian HB. Clinical observation of small needle knife combined with manipulation in the treatment of 63 cases of cervicogenic headache. *Hebei Trad Chin Med*. 2016;38(02):251–254.
24. Du M, Chen D. Effect of acupuncture combined withTuinaon cervicogenic headache (CHE) and its influence on the quality of life of patients. *Friends of Health*. 2018;2018(16):78.
25. Wang LX. Effect of acupuncture combined withTuinaon 84 cases of cervicogenic headache and its influence on quality of life. *J Gannan Med College*. 2018;38(06):565–567.
26. Chen XL. Clinical efficacy of blade needle therapy combined withTuinain the treatment of cervicogenic headache. *Pract Combine Trad Chin West Med Clin*. 2019;12(6):137–139. doi:10.13638/j.iSSN.1671-4040.2019.06.072
27. Hua H, Liantai L, Yanwei L, et al. Observation on the curative effect of head weight back traction combined withTuinain the treatment of cervicogenic headache. *PLA Preventive Med J*. 2019;9:80–81. doi:10.13704/j.carolcarrollnkijyyx.2019.09.089
28. Lin B, Xiguang L, Keke Z. Clinical observation on 32 cases of cervicogenic headache treated byTuinabased on syndrome differentiation along meridians combined with acupuncture. *Jiangsu Trad Chin Med*. 2019;51(10):61–63.
29. Tao L, Ren HY. Effects of warm acupuncture combined with tuina on therapeutic effect, quality of life and neck hemodynamics in patients with cervicogenic headache. *Sichuan Trad Chin Med*. 2019;37(03):179–181.
30. Yajie Z, Hong-lei Z. Effects of warm acupuncture combined with tuina on neck hemodynamics and muscle tension in the treatment of cerviogenic headache. *Clin Med Res Pract*. 2019;4(34):148–150. doi:10.19347/j.carolcarrollnki.2096-1413.201934063
31. Li YL. Effect of acupuncture combined withTuinatherapy on cervicogenic headache. *Acta Medica Sinica*. 2020;18(22):126–127.
32. Chong-long Y, Wei-yang Z, Yan-hong S. Effect of acupuncture combined withTuinaon cervicogenic headache (CHE) and quality of life in patients. *Chin J Clin Med Med*. 2020;7(98):50,58.
33. Bin-qiang L, Zheng-wei P, Yan C, et al. Clinical observation ofTuinacombined with suspension movement therapy in the treatment of cervicogenic headache. *Asian-Pacific Trad Med*. 2021;17(04):60–63.
34. Wang CP. *Clinical Efficacy Observation of Fang's Scalp Needle Therapy Combined with Massage in the Treatment of Cervicogenic Headache*. Guangzhou University of Chinese Medicine; 2025. doi:10.27044/d.cnki.ggzzu.2025.000132
35. Lu LX. Clinical efficacy of tuina manipulation combined with suspension exercise training in the treatment of cerviogenic headache and its effect on sleep quality *Chin Sci Technol Period Database Pharmaceut Health Care*, 2020 (12). https://www.cqvip.com/doc/journal/1000002752035.
36. Xinfu X, Hongjun G, Xiaodi C, et al. Effect of warm acupuncture combined with tuina on patients with cervicogenic headache and its influence on neck hemodynamics. *Tuinaand Rehab Med*. 2021;12(20):1–3. doi:10.19787/j.iSSN.1008-1879.2021.20.001
37. Fang-hua X, Hao Jin-lin LIUJ-Q. Clinical study of acupuncture combined withTuinain the treatment of cervicogenic headache. *New Chin Med*. 2021;12:158–162. doi:10.13457/j.carolcarrollnkiJNCM.2021.12.040
38. Wen-di Z, Xiu-zhen ZHANG. Clinical study of Weixiong analgesic heat and ironing therapy combined with routine medical care measures in the treatment of cervicogenic headache. *New Trad Chin Med*. 2021;7:173–176. doi:10.13457/j.carolcarrollnkiJNCM.2021.07.045
39. Li-jie L, Kun-yu HE. Clinical effect of Tongyuan acupuncture combined withTuinain the treatment of cervicogenic headache. *Chin Commun Phys*. 2023;39(34):61–63. in Chinese. doi:10.3969/j.issn.1007-614x.2023.34.021
40. Jin-long Y, Zhi-hua T, Hua-Kai Z. Clinical study on acupuncture for treating heart and gallbladder combined withTuinafor cervicogenic headache. *Chin J Health Care Liter*. 2020;26(10):145–148.
41. Nambi G, Alghadier M, Khanam H, et al. An additive effect of instrument-assisted soft tissue mobilization with spinal manipulation in cervicogenic headache: a randomized controlled trial. *Pain Ther*. 2024;13(6):1679–1693. doi:10.1007/s40122-024-00671-w
42. Xu X, Ling Y. Comparative safety and efficacy of manual therapy interventions for cervicogenic headache: a systematic review and network meta-analysis. *Front Neurol*. 2025;Thebullock66764. doi:10.3389/fneur.2025.1566764
43. Gong Z, Guo Y, Liu X, Ai K, Li W, Li J. Bibliometric analysis of research trends on tuina manipulation for neck pain treatment over the past 10 years. *J Pain Res*. 2023;16:263–2077. doi:10.2147/JPR.S410603

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