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Manual Therapy for Cervical Radiculopathy: Effects on Neck Disability and Pain – A Systematic Review and Network Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - Study on the correlation between positive signs on X-ray of the upper neck segment and head and neck symptoms, Specialized Project of Traditional Chinese Medicine Research in Sichuan Province, 2024MS192.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202530079

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 March 2025 and was last updated on 18 March 2025.

INTRODUCTION

Review question / Objective To evaluate the application effects of different manual therapy approaches in the treatment of cervical radiculopathy using a network meta-analysis.

Condition being studied Prospective randomized controlled trials on manual therapy for cervical radiculopathy published in PubMed, the Cochrane Library, and Embase databases were retrieved. The neck disability index and visual analogue scale for neck pain were collected and subjected to network meta-analysis.

METHODS

Participant or population A total of 8 eligible studies involving 632 participants with a mean age range of 40-47 years were included. The intervention duration ranged from 4 to 6 weeks. Three intervention groups were defined: Group C (exercise and other therapies without manual therapy), Group M (manual therapy without traction), and Group MT (manual therapy with traction).

Intervention Three intervention groups were defined: Group C (exercise and other therapies without manual therapy), Group M (manual therapy without traction), and Group MT (manual therapy with traction).

Comparator Three intervention groups were defined: Group C (exercise and other therapies without manual therapy), Group M (manual therapy without traction), and Group MT (manual therapy with traction).

Study designs to be included This study was conducted as a meta-analysis of randomized controlled trials (RCTs).

Eligibility criteria We conducted a comprehensive literature search in PubMed, Cochrane Library, and Embase up to June 2024. The search strategy incorporated a combination of Medical Subject Headings (MeSH) terms and free-text keywords to ensure a broad yet focused retrieval of relevant studies. Boolean operators were employed to refine the search, and appropriate filters were applied to enhance specificity. Additionally, we manually reviewed reference lists of pertinent systematic reviews and included studies to identify additional eligible articles. Database-Specific Search Strategies PubMed Search Strategy (("Cervical Vertebrae"[MeSH] OR "Cervical Radiculopathy"[MeSH] OR "cervical" OR "radiculopathy") AND ("Manual Therapy"[MeSH] OR "Physiotherapy"[MeSH] OR "manual therapy" OR "physiotherapy" OR "physical therapy") AND ("Traction"[MeSH] OR "traction")) Filters applied: Human studies, English language, publication date up to June 2024. Cochrane Library Search Strategy ("cervical" OR "cervical radiculopathy") AND ("manual therapy" OR "physiotherapy" OR "physical therapy") AND ("traction") Filters applied: Trials, systematic reviews, English language, publication date up to June 2024. Embase Search Strategy ('cervical radiculopathy'/exp OR 'cervical radiculopathy' OR 'cervical') AND ('manual therapy'/exp OR 'manual therapy' OR 'physiotherapy' OR 'physical therapy') AND ('traction'/exp OR 'traction') Filters applied: Human studies, English language, publication date up to June 2024.

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Main outcome(s) Group M had the highest probability (68.1%) of improving the neck disability index , followed by Group MT (29.1%), with Group C the lowest (2.8%). Compared to Group C, neck disability index scores improved by 0.58 (95% CI: -0.17, 1.33) in Group M and by 0.36 (95% CI: -0.39, 1.11) in Group MT. The difference between Group M and Group MT was not significant (0.22, 95% CI: -0.59, 1.03).For neck pain (visual analogue scale score), Group M had the highest probability (59.5%) of improvement, followed by Group MT (39.6%), with Group C the lowest (0.9%). Compared to Group C, the visual analogue scale score improved by 0.74 (95% CI: -0.04, 1.52) in Group M and by 0.61 (95% CI: -0.18, 1.40) in Group MT. The difference between Group M and Group MT was not significant (0.13, 95% CI: -0.72, 0.98).Egger's regression test showed no apparent publication bias.

Quality assessment / Risk of bias analysis The Intercept of Egger's test is 1.25, with a P-value of 0.018 (P0.05), indicating that the relationship between effect value and standard error is not significant. Confidence interval (95% CI): The 95% confidence interval for the intercept term is (0.23, 2.27), excluding 0, further supporting the existence of publication bias.

Strategy of data synthesis Database-Specific Search Strategies PubMed Search Strategy (("Cervical Vertebrae"[MeSH] OR "Cervical Radiculopathy"[MeSH] OR "cervical" OR "radiculopathy") AND ("Manual Therapy"[MeSH] OR "Physiotherapy"[MeSH] OR "manual therapy" OR "physiotherapy" OR "physical therapy") AND ("Traction"[MeSH] OR "traction")) Filters applied: Human studies, English language, publication date up to June 2024. Cochrane Library Search Strategy ("cervical" OR "cervical radiculopathy") AND ("manual therapy" OR "physiotherapy" OR "physical therapy") AND ("traction") Filters applied: Trials, systematic reviews, English language,

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Subgroup analysis None reported.

Sensitivity analysis 3.4.5 Conclusion from Sensitivity Analysis Removing high-bias, small-sample studies ([19], [20], [23], [24]) strengthens evidence that manual therapy alone is superior to traction-based approaches. The most robust studies ([22], [25]) suggest traction does not significantly enhance treatment outcomes, aligning with the network meta-analysis results. More recent trials ([21]) still suggest some benefit of traction, but the evidence remains inconsistent. Future research should focus on high-quality, large-scale RCTs directly comparing MT alone vs. MT + traction with standardized protocols.

Country(ies) involved China.

Keywords Radiculopathy; Musculoskeletal Manipulations; Posterior Neck Pains; Neck pain.

Contributions of each author
Author 1 - Xueliang Xu.
Author 2 - Yan Ling.