



ORIGINAL ARTICLE

Effectiveness of neural mobilization with intermittent cervical traction in the management of cervical radiculopathy: A randomized controlled trial



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KEYWORDS

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Neck pain;
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Abstract *Background:* The effectiveness of both neural mobilization and intermittent cervical traction (ICT) has been previously explored in some studies of generally low methodological quality. However, the effect of simultaneous application of these techniques in people with cervical radiculopathy (CR) has not been previously investigated.

Aim: To investigate the effect of neural mobilization with simultaneously applied ICT on pain, disability, function, grip strength and cervical range of motion in patients with CR.

Design: Randomized, controlled, assessor-blinded, clinical trial.

Methods: Participants (n = 42) diagnosed with unilateral CR were randomly allocated to intervention (neural mobilization combined with ICT, n = 21) or control (n = 21) groups. Participants in the intervention group were asked to attend for 12 treatment sessions to receive 6 sets of 60s grade II–IV ICT with simultaneously applied 'slider' neural mobilizations with median nerve bias. Participants randomized to the control group did not receive any type of treatment and were asked to avoid prescription or over-the-counter analgesia or anti-inflammatory medication.

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The Neck Disability Index (NDI), the Patient-Specific Functional Scale (PSFS), the Numeric Pain Rating Scale (NPRS), and measures of grip strength (GS) and cervical spine active range of motion (CSAROM) were administered at baseline and at 4-weeks.

Results: The intervention group demonstrated significant improvements in NDI scores (mean difference = -16.95; 95% CI = -22.47 to -11.43, ES = 0.42), PSFS scores (mean difference = 2.88; 95% CI = 2.33 to 3.43, ES = 0.66), NPRS scores (mean difference = -3.74; 95% CI = -4.92 to -2.96, ES = 0.37), GS (mean difference = 1.87 kg; 95% CI = 0.51 to 3.23; ES = 0.07), and CSAROM (except for lateral flexion), compared to the control group where significant changes were not detected.

Conclusion: Neural mobilization with simultaneous ICT can improve, pain, function, disability, grip strength and cervical range of motion in people with CR. Further clinical trials comparing neural mobilization with cervical traction to other standard interventions are justified.

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Implications for practice

- Neural mobilization combined with intermittent cervical traction can produce clinically meaningful improvements in pain and disability.
- The combination of these techniques could improve neck function.
- Cervical spine range of motion could improved significantly with this practice in cervical radiculopathy patients.

Introduction

Cervical radiculopathy (CR) is a peripheral nervous system disorder affecting the normal function of cervical nerve roots (CNRs) and is often associated with chronic pain and functional limitations in daily life.^{1–5} The annual incidence of CR has been reported to be 83 cases per 100,000 people in the population, with an increased prevalence in the fourth to sixth decade of life.^{6–8}

CR is associated with mechanical and/or inflammatory stimuli around the CNRs and several imaging studies have demonstrated cervical disc herniation and osteophytic encroachment to be the most common lesions that lead to nerve root compression, inflammation, or both.^{3,5,9} These lesions may affect sensory and motor fibers of CNRs, producing neuropathic symptoms described as 'burning', 'shooting', 'sharp' pain or 'electric-shock-like', sensory (numbness or paraesthesia) and motor (muscle weakness or loss of active

movement) signs in the upper-limb.^{1,6,10–12} In order to identify CR, these signs and symptoms may be further investigated using magnetic resonance imaging (MRI) and electrodiagnostic studies, although these are not always feasible in clinical practice.^{4,7,13}

A variety of manual therapy techniques including intermittent cervical traction (ICT) and neural mobilization have been proposed to reduce pain and functional limitations in CR.^{7,14–20} Using MRI and CT scans, a small number of imaging studies indicate that ICT can modify mechanical stimuli compressing the involved CNR by increasing intervertebral space, widening the cervical neural foramina, and reducing intradiscal pressure.^{8,15,21} It has been also suggested that application of ICT can disperse inflammation at CNRs,²² however the mechanism behind this action remains poorly understood. The therapeutic value of ICT for CR is not clear, as studies of its effectiveness have generally been of poor methodological quality due to inappropriate use of homogenous participants, short-term follow-ups and small sample sizes.^{5,23,24}

Neural mobilization was introduced as an intervention for pain relief more than 25 years ago and is advocated in CR to facilitate nerve 'sliding' (also described as 'gliding') and normalization of mechanosensitivity at involved CNRs.^{16,19,25} There is some evidence demonstrating the benefits of neural mobilization in the management of peripheral neuropathies including carpal tunnel syndrome²⁶ lumbar radiculopathy²⁰ and CR.^{18,19} Neural mobilization in patients with CR is common, although previous studies of neural mobilization in CR have been compromised by several methodological weaknesses, including the lack of randomization, absence of an adequate control

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