

EFFECTIVENESS OF RADIAL NERVE MOBILISATION WITH CONVENTIONAL PHYSIOTHERAPY IN CERVICAL SPONDYLOSIS WITH RADICULOPATHY: A RANDOMISED COMPARATIVE PILOT STUDY

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ABSTRACT

Introduction: Cervical spondylosis is a common degenerative disorder leading to cervical radiculopathy. Conventional physiotherapy provides symptomatic relief but may not address altered neurodynamics. Radial nerve mobilisation has been proposed as an adjunctive therapy, though limited evidence exists.

Aim: To compare the effectiveness of radial nerve mobilisation plus conventional physiotherapy versus conventional physiotherapy alone in cervical spondylosis with radiculopathy in a pilot study.

Materials and Methods: A prospective, randomized, comparative pilot study was conducted on 40 patients with cervical spondylosis with radial nerve radiculopathy. Participants were randomized into two groups: Group A (radial nerve mobilisation + conventional physiotherapy) and Group B (conventional physiotherapy alone). Interventions were given thrice weekly for four weeks. Pain (VAS) and disability (NDI) were assessed at baseline, 2 weeks, and 4 weeks. Data were analysed using paired and independent t-tests.

Results: Both groups showed significant improvements ($p < 0.001$). Group A showed greater reduction in VAS (7.2 ± 0.8 to 2.1 ± 0.6) and NDI (38.5 ± 5.2 to 14.2 ± 4.6) compared to Group B (VAS 7.1 ± 0.7 to 3.8 ± 0.9 ; NDI 37.9 ± 5.0 to 20.6 ± 5.3).

Conclusion: Radial nerve mobilisation combined with conventional physiotherapy appears more effective than conventional physiotherapy alone in cervical radiculopathy. As this was a pilot study, larger multicentric trials are warranted.

KEYWORDS: Cervical radiculopathy; Neural mobilisation; Radial nerve; Pilot study.

INTRODUCTION

Cervical spondylosis is one of the most prevalent degenerative spinal disorders worldwide, often leading to cervical radiculopathy which manifests as pain, sensory disturbance, and motor deficits [1,2]. Globally, neck pain ranks fourth in disability burden, accounting for a significant number of years lived with disability [3]. In India, changing lifestyle patterns and sedentary occupations have led to increasing cases of cervical radiculopathy [4]. Conservative physiotherapy including moist heat, isometric exercises, and traction is commonly employed [5], but these modalities may not adequately address neural mechanosensitivity. Neural mobilisation, also referred to as neurodynamics, is a manual therapy technique aimed at restoring the mobility and elasticity of the nervous system [6]. Among the peripheral nerves, the radial nerve is particularly vulnerable due to its long anatomical course and entrapment sites [7]. Most existing trials have focused on median or ulnar nerve mobilisation [8,9], leaving a gap in evidence for radial nerve-specific protocols. Hence, there is a need to investigate radial nerve mobilisation as an adjunct to conventional

physiotherapy. This pilot study was therefore designed to compare the effectiveness of radial nerve mobilisation plus conventional therapy versus conventional therapy alone in patients with cervical spondylosis with radiculopathy.

MATERIALS AND METHODS

This was a prospective, randomised, comparative pilot study conducted in the Department of Physiotherapy, Mahatma Gandhi Hospital, Jaipur, Rajasthan, between January and June 2024. Ethical approval was obtained from the Institutional Ethics Committee (IEC No: MGMC&HI/EC/JPR/2023/1812), and the study was registered with the Clinical Trials Registry of India (CTRI/2024/10/075763). Informed consent was obtained from all participants. Forty patients aged ≥40 years clinically diagnosed with cervical spondylosis with radial nerve radiculopathy were recruited and randomly allocated into two groups (20 each) using a computer-generated randomisation list. Inclusion criteria were symptoms >4 weeks, unilateral upper limb involvement, and positive Spurling’s, Distraction, and ULTT 3 (radial bias) tests [10]. Exclusion criteria included other nerve radiculopathies, cervicogenic headache, fractures, congenital deformities, thoracic outlet syndrome, previous cervical surgery, or recent trauma [11]. Group A received radial nerve mobilisation (15 repetitions, 5-second hold, thrice weekly) in addition to conventional physiotherapy (moist heat 15–20 minutes and isometric cervical exercises), while Group B received only conventional physiotherapy. Pain was assessed with the Visual Analogue Scale (VAS) [12] and disability with the Neck Disability Index (NDI) [13] at baseline, 2 weeks, and 4 weeks. Data were analysed using SPSS v25. Paired t-tests compared within-group changes, and independent t-tests compared between-group outcomes, with significance set at p≤0.05.

RESULTS

A total of 40 participants completed the study, with 20 in each group. The demographic characteristics, including mean age and gender distribution, were comparable between the groups, as shown in Table 1. The mean age of participants in Group A was 48.6±6.3 years and in Group B was 47.9±7.1 years. The gender distribution was also similar between groups. Pain intensity assessed using the Visual Analogue Scale (VAS) showed significant improvement in both groups over four weeks. Group A demonstrated a reduction from 7.2±0.8 at baseline to 2.1±0.6 at week 4, while Group B reduced from 7.1±0.7 to 3.8±0.9. The intragroup changes were statistically significant (p<0.001), and intergroup comparison revealed Group A had a significantly greater reduction in pain at week 4 (p=0.002), as summarised in Table 2 and Table 3. Functional disability assessed using the Neck Disability Index (NDI) also improved significantly in both groups. Group A improved from 38.5±5.2 at baseline to 14.2±4.6 at week 4, while Group B improved from 37.9±5.0 to 20.6±5.3. The intragroup changes were significant (p<0.001), and intergroup analysis at week 4 showed Group A had significantly better outcomes than Group B (p=0.01). These results are presented in Table 2 and Table 3. Overall, the findings suggest that both conventional physiotherapy alone and radial nerve mobilisation combined with conventional physiotherapy are effective in reducing pain and disability among patients with cervical spondylosis with radiculopathy. However, the addition of radial nerve mobilisation resulted in superior clinical outcomes. The improvements are also illustrated graphically in Figure 1 (VAS) and Figure 2 (NDI), and the participant flow through the study is presented in Figure 3 (CONSORT flowchart).

Table 1: Baseline Demographics of Participants

Variable	Group A (n=20)	Group B (n=20)
Age (years, mean±SD)	48.6±6.3	47.9±7.1
Gender (M/F)	12/8	11/9

Table 2: Intragroup Comparison of VAS and NDI Scores

Measure	Group	Baseline	4 weeks	p-value
VAS	A	7.2±0.8	2.1±0.6	<0.001
NDI	A	38.5±5.2	14.2±4.6	<0.001

Table 3: Intergroup Comparison of VAS and NDI at 4 Weeks

Measure	Group A	Group B	p-value
VAS (4 weeks)	2.1±0.6	3.8±0.9	0.002
NDI (4 weeks)	14.2±4.6	20.6±5.3	0.01

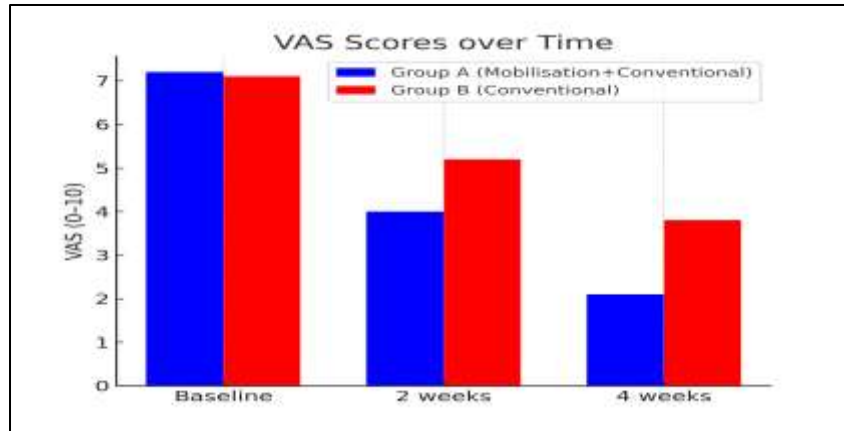


Figure 1: VAS Bar Graph

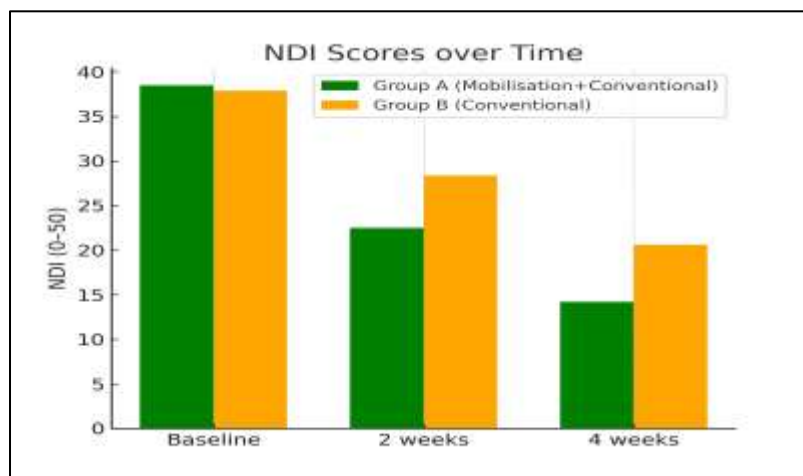


Figure 2: NDI Bar Graph

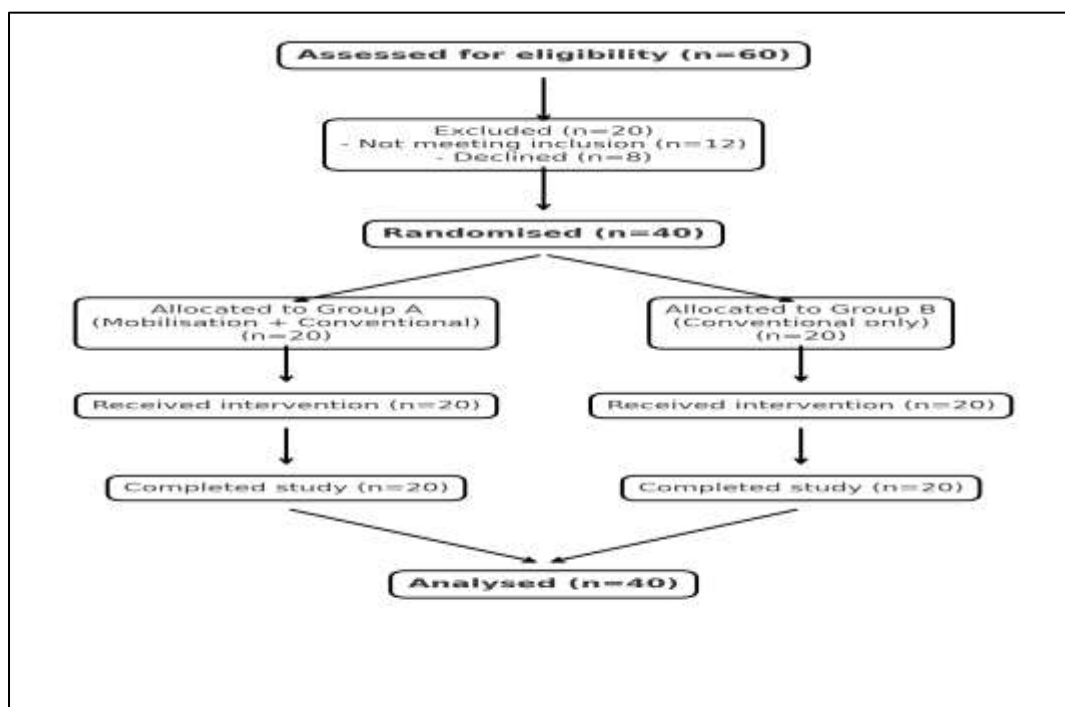


Figure 3: CONSORT Flowchart of the Study Participants

DISCUSSIONS

This pilot study demonstrated that radial nerve mobilisation combined with conventional physiotherapy is more effective than conventional therapy alone in reducing pain and disability in cervical radiculopathy. The results are consistent with earlier research demonstrating that neural mobilisation reduces pain intensity and improves function [14–16]. Yildirim et al. [17] specifically reported acute benefits of radial nerve mobilisation. The observed improvements can be attributed to restoration of neural mobility, improved axoplasmic flow, reduced intraneural edema, and modulation of mechanosensitivity [18,19,20]. This study adds to limited evidence on radial nerve mobilisation, which has been underexplored compared to median and ulnar nerve biases. Clinical relevance includes incorporation of radial nerve mobilisation into physiotherapy protocols for patients with cervical radiculopathy, particularly those with radial nerve bias [20-25]. Limitations include small sample size, single-centre setting, and short follow-up. As this was a pilot study, results should be interpreted cautiously. Future research should involve larger multicentric trials with long-term follow-up.

CONCLUSION

Radial nerve mobilisation combined with conventional physiotherapy appears more effective than conventional physiotherapy alone in reducing pain and disability in cervical radiculopathy. As this was a pilot study, larger multicentric trials with long-term follow-up are recommended.

LIMITATIONS

Small sample size (n=40), single-centre design, and short follow-up duration limit generalisability.

FUTURE SCOPE

Future studies should involve larger, multicentric randomised controlled trials, incorporate objective neurophysiological assessments, and include long-term follow-up.

CONFLICT OF INTEREST

None declared.

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