

Effectiveness of Conventional Physiotherapy With or Without Neural Flossing Techniques on Cervical Radiculopathy

Miss. Pranali Pankaj Chavan¹, Dr. Anandh Shrinivasan²

¹INTERN, Krishna College of Physiotherapy, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India.415110

²Professor, department of community health physiotherapy, Krishna college of physiotherapy, Krishna Vishwa Vidyapeeth, deemed to be university, karad 41539 Maharashtra , India.

*Corresponding Author:
Dr. Anandh Shrinivasan

Article History

Received: 09.09.2025

Revised: 24.09.2025

Accepted: 09.10.2025

Published: 22.10.2025

Abstract: Cervical radiculopathy is a common condition that leads to neck pain, radiating arm discomfort, and functional limitations. This study compares the outcomes of conventional physiotherapy alone with those of physiotherapy combined with neural flossing techniques. Both treatment groups showed improvement in pain and mobility, but participants who received neural flossing reported greater reductions in symptoms and better functional recovery. The results indicate that integrating neural flossing with standard physiotherapy can enhance the overall effectiveness of rehabilitation for cervical radiculopathy. **AIM:** To study investigate effectiveness of Conventional Physiotherapy With or Without Neural Flossing Techniques on Cervical Radiculopathy. **Methodology:** A six-month comparative experimental study was conducted on patients aged 30–50 years diagnosed with cervical radiculopathy. Participants were randomly divided into two groups: Group A received conventional physiotherapy with mechanical traction, while Group B received conventional physiotherapy with neural flossing techniques. Both groups underwent sessions three times per week for four weeks. The Neck Disability Index (NDI) was used to assess outcomes before and after intervention, and data were analysed statistically to compare within- and between-group improvements. **Result:** Both groups showed significant improvement in Neck Disability Index (NDI) scores following treatment ($p < 0.0001$). Group A, which received conventional physiotherapy with neural flossing, demonstrated a greater reduction in disability levels (mean post NDI: 3.24 ± 1.86) compared to Group B, which received conventional physiotherapy alone (mean post NDI: 6.42 ± 4.21). The between-group comparison revealed a statistically significant difference ($p = 0.0002$), favouring the combined intervention. **Conclusion:** The results indicate that both treatment methods effectively decrease neck-related disability; however, integrating neural flossing with conventional physiotherapy yields better clinical outcomes. The addition of neural mobilization techniques appears to promote greater functional improvement and faster recovery in individuals suffering from cervical radiculopathy when compared to conventional physiotherapy on its own.

Keywords: Cervical Radiculopathy , Neural Flossing, Neck Disability , conventional physiotherapy.

INTRODUCTION

Cervical radiculopathy is a condition that occurs due to the compression or irritation of the nerve roots in the cervical spine, leading to pain, sensory abnormalities, or motor impairments along the pathway of the affected nerve.(1) Cervical radiculopathy can lead to pain that radiates from the neck into the arm, often accompanied by sensory disturbances, muscle weakness, and alterations in reflexes corresponding to the affected dermatome or myotome. Cervical radiculopathy is most commonly caused by degenerative changes in the cervical spine, including conditions like disc herniation, cervical spondylosis, or foraminal stenosis. (2) Cervical radiculopathy is often accompanied by sensory changes like numbness, tingling, or burning, along with motor deficits such as arm or hand weakness that can impair grip and fine motor skills. Reflexes may be diminished or absent. Symptoms typically worsen with neck movements that increase nerve root pressure, and severe cases can result in sharp pain and significant functional limitations affecting daily life(9).\

Cervical radiculopathy is relatively uncommon but significant, predominantly affecting middle-aged

individuals. Its annual incidence is estimated at 83 cases per 100,000 people, with a slightly higher occurrence in men than women (3). The condition typically develops in individuals between the ages of 40 and 60, aligning with the peak onset of degenerative changes in the cervical spine.(4) The C6 and C7 nerve roots are the most commonly affected, representing about 60-70% of cases. This prevalence is linked to the increased mechanical stress and greater mobility of the lower cervical spine.(5)

Several risk factors contribute to the development of cervical radiculopathy. Age-related degeneration, such as spondylosis and changes in intervertebral discs, is a significant cause.(6) Occupational activities or repetitive strain from jobs that require prolonged neck flexion or extension can also increase the risk.(7) Lifestyle factors, including smoking and poor posture, may exacerbate degenerative changes in the cervical spine. Additionally, trauma, such as whiplash injuries or acute strain to the cervical spine, can further predispose individuals to this condition.(8).

Cervical radiculopathy is diagnosed through clinical evaluation, including symptom history, physical tests like Spurling's test, and imaging methods such as MRI(10). EMG and nerve conduction studies are used to assess nerve function, helping confirm the diagnosis(11). Cervical radiculopathy is typically managed with conservative treatments aimed at reducing pain and improving functions. Cervical radiculopathy is initially managed with conservative treatments, including NSAIDs or corticosteroids for pain and inflammation, cervical traction, and muscle relaxants for spasms. (12).

Conventional physiotherapy effectively manages mild to moderate cervical radiculopathy, providing notable improvements in pain relief, mobility, and functional ability (13) . These exercises involve controlled movements that alternately lengthen and shorten the nerve pathway, reducing adhesions, enhancing circulation, and decreasing neural tension. (14)

Common nerve flossing techniques for cervical radiculopathy target the median, ulnar, and radial nerves, helping to restore normal nerve function and alleviate pain.(15)

MATERIAL AND METHODS

To evaluate the impact of interpretation of Conventional Physiotherapy With or Without Neural Flossing Techniques on Cervical Radiculopathy.

INCLUSION CRITERIA

1. Patients diagnosed with cervical radiculopathy (based on clinical assessment and imaging findings)
2. Spurling's Test (Foraminal Compression Test) positive.
3. Upper Limb Tension Test (ULTT) positive
4. Subjects with age 30-50 years Patients having pain for more than 15 days or recurrent radiating pain.

EXCLUSION CRITERIA

1. Traumatic injuries of upper limb and cervical spine
2. Dizziness or vomiting or any other symptoms of Vestibular related disorders.
3. Circulatory disturbances of upper extremity
4. Spinal cord injury and malignancy

STUDY POPULATION

PROCEDURE

- a) Permission will be obtained from the authorities in the area where the study will be conducted.
- b) Based on the inclusion and exclusion criteria, the sample population will be selected.
- c) The procedure of the study will be explained to the participants.
- d) A consent form will be filled out by those who are willing to participate in the study. Subjects will be given instructions on how to fill out the consent form.

- e) Instructions will be given regarding what assessments are going to be taken.
- f) Following the pre-investigation measurements, subjects will be divided into two groups. The groups will be referred to as Group A and Group B.
- g) Group A will receive Conventional physiotherapy with mechanical traction, and Group B will receive manual physiotherapy
- h) Each group will receive intervention sessions three times per week for four weeks. Each session will take about 30 minutes.
- i) Effectiveness will be determined based on neck disability index and physical examinations (e.g. range of motion, spinal flexibility, muscle strength, upper limb nerve tension testing) of patient
- j) Based on responses, statistical data will be analysed.
- k) The results and conclusions will be determined.
- l) This procedure will be carried out according to the given time frame of the study.

The following exercise protocol will be followed by the participants

Group A

Conventional physiotherapy

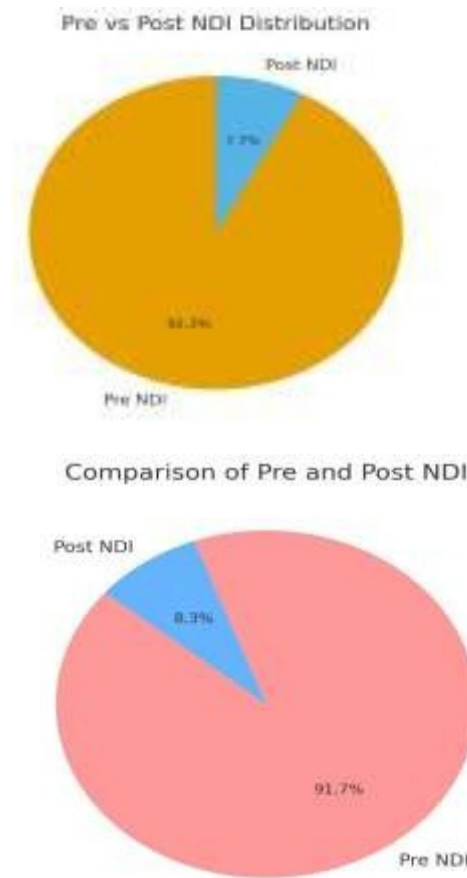
1. Hot moist pack (15 min)
2. Transcutaneous electrical nerve stimulation (10 min)
3. Mechanical cervical traction (Cervical traction for 15 minutes 7% of body weight with 7 seconds hold time and 5 seconds rest time)
4. Remedial exercises
5. Graded exercises : isometric neck exercises (10 repetitions in each direction with 10seconds hold and twice a day
5. Posture correction techniques with support
6. Neural flossing techniques
7. Median Nerve Flossing
8. Ulnar Nerve Flossing
9. Radial Nerve Flossing

Group B

Conventional physiotherapy

1. Hot moist pack (15 min)
2. Transcutaneous electrical nerve stimulation (10 min)
3. Mechanical cervical traction (Cervical traction for 15 minutes 7% of body weight with 7 seconds hold time and 5 seconds rest time)
4. Remedial exercises
5. Graded exercises : isometric neck exercises (10 repetitions in each direction with 10seconds hold and twice a day
6. Posture correction techniques with support

STATISTICALLY ANALYSIS AND INTERPRETATION GROUP A GROUP B



RESULTS AND OBSERVATIONS:

Comparison of neck disability index values between group A and group B pre and post

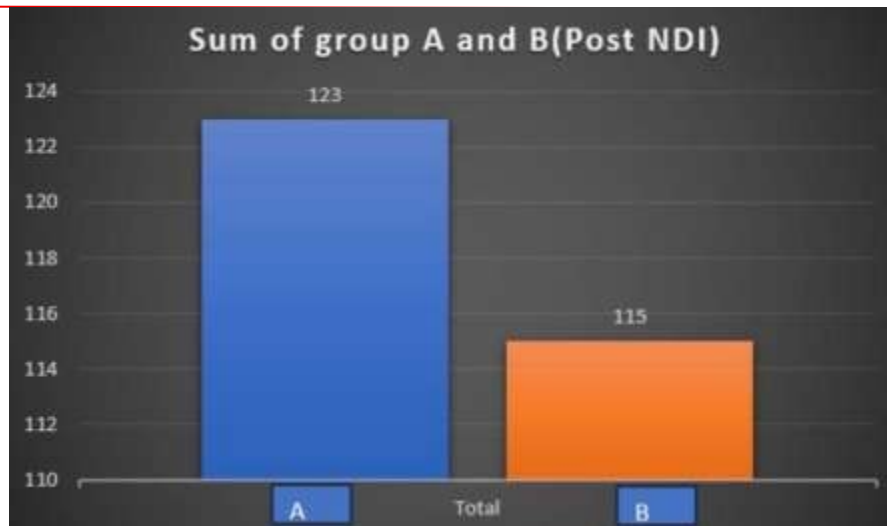
Parameters	Pre mean standard	Post mean standard	P value
Group A	31.66 + 105	3.24 + 1.86	Less than < 0.0001 extremely significant
GROUP B	30.244+ 9.805	6.42 + 4.21	

According to Wilcoxon matched pairs test pre and post-test p value less than < 0.0001 considered extremely significant

Comparison of neck disability index values post group A and group B

Parameters	Post NDI	P valve
Group A	3.24+1.869	0.0002 consider extremely significant
Group B	6.428+4.21	

According to Mann Whitney test the p value is 0.0002 consider extremely significant



Comparison between group A and group B treatment protocols

DISCUSSION

The results of this study add to the expanding evidence supporting physiotherapy interventions for managing cervical radiculopathy (CR). Conventional physiotherapy, which incorporates treatments like electrotherapy, cervical traction, and therapeutic exercises, is commonly utilized to alleviate pain and enhance functional recovery in CR patients. However, integrating neural flossing techniques has been suggested as a promising approach to further improve symptom relief by specifically targeting neural mobility restrictions.

The study indicates that while conventional physiotherapy alone is effective in relieving pain and enhancing cervical function, incorporating neural flossing techniques offers additional advantages, particularly in reducing radiating pain and enhancing nerve mobility. These results are consistent with previous research, which suggests that neural mobilization techniques aid in decreasing nerve tension, promoting blood circulation, and improving range of motion in cases of nerve entrapment.

Two studies were rated as having a low risk of bias. The evidence suggests, at a low level, that a cervical collar is not superior to physiotherapy in the short term, and at a very low level, that a collar offers no greater benefit than traction. Additionally, low-level evidence indicates that traction is not more effective than placebo traction, while very low-level evidence suggests no significant difference between intermittent and continuous traction. (12)

The self-administered neural flossing technique alleviated pain, improved neck function, and enhanced the range of motion by reducing discomfort. This method is straightforward and effective for mobilizing neural tissue while also addressing the surrounding soft tissues. (16)

The study found that Mulligan manual traction and neural mobilization were both effective in managing pain and enhancing functional abilities in patients with cervical radiculopathy. However, neither technique proved to be superior to the other. (17)

CONCLUSION

Both conventional physiotherapy and physiotherapy with neural flossing effectively reduced pain and disability in cervical radiculopathy. However, adding neural flossing produced greater improvement in function and recovery, making it a more effective approach for managing cervical radiculopathy conservatively.

REFERENCES

1. Caridi JM, Pumberger M, Hughes AP. Cervical radiculopathy: a review. *HSS Journal*. 2011 Oct;7(3):265-72.
2. Woods BI, Hilibrand AS. Cervical radiculopathy: epidemiology, etiology, diagnosis, and treatment. *Clinical Spine Surgery*. 2015 Jun 1;28(5):E251-9.
3. Ben-Nun L. Cervical spine fracture in the elderly.
4. Hult L. Cervical, dorsal and lumbar spinal syndromes: a field investigation of a non-selected material of 1200 workers in different occupations with special reference to disc degeneration and so-called muscular rheumatism. *Acta Orthopaedica Scandinavica*. 1954 Dec 1;25(sup17):1-02.
5. MEADOWS J, ARMIJO-OLIVO SL, MAGEE DJ. Cervical Spine. *Pathology and Intervention in Musculoskeletal Rehabilitation-E-Book*. 2015 Nov 3:63.
6. Corey DL, Comeau D. Cervical radiculopathy. *Medical Clinics*. 2014 Jul 1;98(4):791-9.
7. Bernard BP, Putz-Anderson V. Musculoskeletal disorders and workplace factors: a critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back.

8. Treadway D. Anatomy, Vulnerability, and Musculoskeletal Injury of the Human Neck.
9. Rao R. Neck pain, cervical radiculopathy, and cervical myelopathy: pathophysiology, natural history, and clinical evaluation. *JBJS.* 2002 Oct 1;84(10):1872- 81.
10. Thoomes EJ, van Geest S, van der Windt DA, Falla D, Verhagen AP, Koes BW, Thoomes-de Graaf M, Kuijper B, Scholten-Peeters WG, Vleggeert-Lankamp CL. Value of physical tests in diagnosing cervical
11. radiculopathy: a systematic review. *The Spine Journal.* 2018 Jan 1;18(1):179-89.
12. Kane NM, Oware A. Nerve conduction and electromyography studies. *Journal of neurology.* 2012 Jul;259:1502-8.
13. Thoomes EJ, Scholten-Peeters W, Koes B, Falla D, Verhagen AP. The effectiveness of conservative treatment for patients with cervical radiculopathy: a systematic review. *The Clinical journal of pain.* 2013 Dec 1;29(12):1073-86.
14. Plener J, Csiernik B, To D, da Silva-Oolup S, Hofkirchner C, Cox J, Cancelliere C, Chow N, Hogg- Johnson S, Ammendolia C. Conservative management of cervical radiculopathy: a systematic review. *The Clinical Journal of Pain.* 2023 Mar 1;39(3):138-46.
15. Daniela M, Catalina L, Ilie O, Paula M, Daniel- Andrei I, Ioana B. Effects of exercise training on the autonomic nervous system with a focus on anti- inflammatory and antioxidants effects. *Antioxidants.* 2022 Feb 10;11(2):350.
16. Marsic BA. The Effect of Upper Limb Neurodynamic Mobilizations on Pain and Functionality in Patients with Cervicobrachial Pain Syndrome or Cervical Radiculopathy: A Systematic Review and Meta-Analysis. Oklahoma State University; 2021.
17. Kumar S, Lama TN. Immediate effect of self neural flossing in cervical radiculopathy a pre and post experimental study effectual immediate techniques” self neural flossing”* în radiculopatia cervicală-studiu pre-post experimental.
18. Hayat R, Akbar U, Perveen W, Ali MA, Anwar S, Asif R. Comparison of mulligan traction and neural mobilizations in the management of pain in patients with cervical radiculopathies; a quasi-experimental study. *Journal Riphah College of Rehabilitation Sciences.* 2022 Dec 9;10(02).

