



EFFECT OF MCKENZIE TECHNIQUE WITH ICT AND CONVENTIONAL EXERCISE WITH ICT IN CERVICAL RADICULOPATHY

Physiotherapy

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ABSTRACT

Cervical radiculopathy is marked by nerve compression of a herniated disk. McKenzie and ICT are more used in participants with Cervical Radiculopathy. There are no studies that combine the McKenzie with ICT and Conventional Exercise with ICT in participants with Cervical Radiculopathy. The study aimed to find the effects of the McKenzie Technique with ICT and Conventional Exercise program with ICT in participants with Cervical Radiculopathy to determine the better of these for benefit of participants. So, a Quasi-Experimental study was conducted with 30 participants that featured Cervical Radiculopathy. They were studied for a 4-weeks intervention. They were divided into 2 groups by convenience sampling: - Group A: McKenzie Technique with ICT and Group B: Conventional Exercise with ICT. Pre- and post-treatment data were collected and analyzed using SPSS 22.0. Paired and unpaired t-test was used to find out the significance of the treatment. A significant improvement in pain, disability, muscle strength, and endurance ($p < 0.05$) after the treatment was found in both groups. Greater statistically significant improvement was seen in Group A as compared to Group B. Thus, the study concluded that McKenzie Technique with ICT was more effective in Cervical Radiculopathy.

KEYWORDS

Cervical Radiculopathy, Neck Disability Index, Pressure Bio-Feedback Unit, Cervical Traction Unit

1. INTRODUCTION

"Cervical Radiculopathy" is a disease marked by nerve compression from a herniated disk or arthritic bone spurs. This impingement typically produces neck and radiating arm pain, sensory deficits, or motor dysfunction in the neck and upper extremities. It is a broad disorder with several mechanisms of pathology. Cervical Radiculopathy occurs with pathologies that affect the nerve roots. Those can be compression, irritation, traction on the nerve root caused by either a herniated disc, foraminal narrowing, or degenerative changes that lead to stenosis of the intervertebral foramen.^[1]

Patients usually present with complaints of pain, numbness, tingling, and weakness in the upper extremity, stiff neck and a decrease in cervical spine ROM, secondary musculoskeletal problems, decrease in muscle length of the cervical spine musculature, joint stiffness, capsule tightness, and postural defects which can affect movements of the rest of the body.^[2] In the rehabilitation of Cervical Radiculopathy, a variety of conventional treatment options are available, including strengthening or stretching exercises for the cervical and thoracic spines, manual therapy techniques, cervical traction, and postural education.^[3]

The McKenzie protocol has been commonly used in low back conditions but is also applied in treating mechanical neck pain in three syndromes: Postural, Dysfunctions, and Derangement.^[4] The study by Mann et al showed McKenzie can be effective in forwarding head posture.^[5]

The McKenzie method exists of 4 steps:^[6,7]

- 1. Assessment:** Clinician taking a history of symptoms and how they behave. Performing certain movements and adopting specific positions.
- 2. Classification:** Based on the assessment of the spine and limbs are classified into three subgroups: Derangement, Dysfunction, and Postural Syndrome. The choice of exercises in the McKenzie method is based upon the movements of the spine.
- 3. Treatment:** The therapy aims to reduce pain and symptoms, the complete recovery of pain.
- 4. Prevention:** It consists of educating and encouraging the patient to exercise regularly and self-care.

Intermittent Cervical Traction (ICT) has been indicated for the conservative treatment of patients with a cervical herniated disc, and it has been suggested as an appropriate intervention for patients with mild Cervical Radiculopathy when the spinal cord compression is believed to be caused by a cervical herniated disc. Traction increases the intervertebral gap and space of intervertebral foramina to relieve pressure on the affected nerve root. The results of Cervical Traction are more satisfactory when severe muscle pain is subsided.^[8,9,10]

2. METHODOLOGY

The participants of Cervical Radiculopathy were identified from Orthopaedic Physiotherapy OPD of Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar. Participants of both genders whose age was between 25 to 45 years with the symptoms of Cervical Radiculopathy from 6 to 12 weeks. NPRS rating 5 or more than 5 and those who were willing to be a part of the study were included in the study. These participants were informed about the study and the procedure was clearly explained to all. An informed and written consent was obtained from the participants who agreed to be a part of the study that was to be conducted. Participants with neck pain attributed to any specific pathology like neck and arm injuries, disc herniation, infection or fracture, osteoporosis, structural deformity, and inflammatory disorders. And even participants with constant or severe neck pain judged on clinical grounds due to nerve root irritation were excluded from the study.^[11]

The participants were selected by convenience method in A and B groups. A total of 30 participants with a mean age of 35.6 ± 5.89 (mean \pm SD) became part of the study. The pre-evaluation included an Orthopaedic assessment which obtained information about demographic details, medical history, personal history, pain assessment, functional scale, muscle strength, and endurance of the participants. The pain was assessed by the Numerical Pain Rating Scale (NPRS), functional disability was scored by Neck Disability Index (NDI), and Cervical Muscle Endurance and Strength by Pressure Biofeedback Unit. The study was approved by the Institutional Ethics Committee of Nootan College of Physiotherapy.

The participants of Group A were treated with McKenzie Technique with ICT and Group B treated with Conventional Exercise with ICT. The treatment protocol consisted of 5 sessions of McKenzie Technique with ICT/week, and 5 sessions of Conventional Exercise with ICT /week for 4 weeks. After 4 weeks of treatment, the participants of both groups underwent post-evaluation, and the pre-and post-treatment data were evaluated further.

	Week 1	Week 2	Week 3	Week 4
McKenzie Technique	Neck Flexion with Chin Tuck-in, patient in supine position	Neck Extension with Chin Tuck-in, patient in sitting position	Neck Extension with Traction, patient in supine position	Retraction and Neck Flexion with Over pressure, patient in sitting position
Tension Type	Intermittent tension Hold- 30 sec Relax - 15 sec	Intermittent tension Hold- 30 sec Relax - 15 sec	Intermittent tension Hold- 30 sec Relax - 15 sec	Intermittent tension Hold- 30 sec Relax - 15 sec
Traction Force	7 % of body weight	7 % of body weight	7 % of body weight	7 % of body weight
Patient position	Supine lying	Supine lying	Supine lying	Supine lying
Duration	4 days/week 1 session/Day	4 days/week 1 session/Day	5 days/week 1 session/Day	5 day/week 1 session/Day

Table No.2: Exercise Protocol for Group B

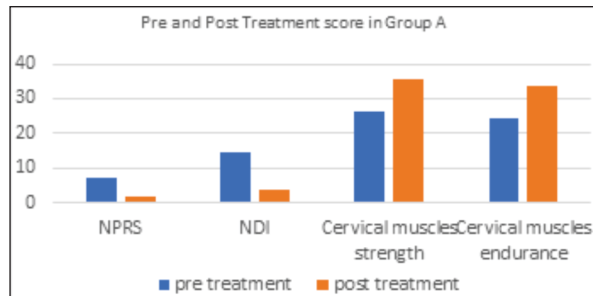
WEEK 1	WEEK 2	WEEK 3	WEEK 4
1.Stretching: [15 seconds hold for 3 repetitions]	1.Stretching: [15 seconds hold for 3 repetitions]	1.Stretching: [15 seconds hold for 3 repetitions]	1.Stretching: [15 seconds hold for 3 repetitions]
2.Active range of motion exercise: [5 repetitions each]	2.Active range of motion exercise: [3 repetitions each]	2.Active range of motion exercise: [3 repetitions each]	2.Active range of motion exercise: [3 repetitions each]
	3.Cervical Isometrics: [3-5 repetitions each]	3.Cervical Isometrics: [3-5 repetitions each]	3.Cervical Isometrics: [3-5 repetitions each]

3. Interpretation

Pre- and post-treatment data of the participants of both groups were noted. All statistical analysis was done using SPSS 22.0 software for windows. Descriptive analysis was obtained by using mean & standard deviation. The intergroup comparison between Group A and B of pre-treatment and post-treatment of NPRS, NDI, and cervical muscle strength and endurance was done by paired t-test. The intragroup comparison of pre-treatment and post-treatment of NPRS, NDI, and cervical muscle strength and endurance within Group A and Group B was done by unpaired t-test.

The results found in this study disclosed that after a 4 weeks treatment program, both groups, Group A, received McKenzie Technique with ICT, and Group B received Conventional Exercise with ICT attained a significant improvement in the strength and endurance of cervical muscles and reduced pain and disability, but statistically greater significant improvement was seen in Group A as compared to Group B (p-value<0.05).

Outcome	GROUP-A				GROUP-B			
	Pre-Treatment Mean ± SD	Post-Treatment Mean ± SD	t-value	p-value	Pre-Treatment Mean ± SD	Post-Treatment Mean ± SD	t-value	p-value
NPRS	6.9 ± 1.03	1.8 ± 0.67	14.6	0.00	7.06 ± 1.16	3.2 ± 1.08	13.03	0.00
NDI	14.4 ± 1.91	3.80 ± 1.01	16.05	0.00	15.2 ± 1.48	11.8 ± 1.8	9.53	0.00
Cervical Muscle Strength	26.2 ± 1.83	35.4 ± 2.06	-13.7	0.00	26.9 ± 1.98	30.6 ± 1.9	-11.2	0.00
Cervical Muscle Endurance	24.4 ± 1.72	33.6 ± 1.54	-21.5	0.00	25.3 ± 2.22	29.06 ± 1.9	-8.67	0.00



4. DISCUSSION

The results found in this study disclosed that after a 4 weeks treatment program, both groups, Group A, received the McKenzie Technique with ICT, and Group B received Conventional Exercises with ICT attained a significant improvement in the strength and endurance of the neck muscles and reduced pain and disability.

Cervical Radiculopathy is an important subset of neck disorders, although less widespread than the common neck pain. Its severity in terms of pain and disability is much more as compared to general neck pain.^[12,13]

Constantoyannis et al.as they reported that ICT helps to relieve the inflammatory reaction of nerve roots by improving the circulation to the tissues and reducing swelling of the tissues, gentle alteration of stretching and relaxation of the spasm of neck muscles and soft tissue structures prevents the formation of adhesions of the Dural sleeve.^[14]

The McKenzie Technique was frequently used as a treatment modality for patients with mechanical problems of the spine. The method has a high trust among physiotherapists, but there is scientific evidence that McKenzie Technique is effective for patients with neck pain.^[15]

This study was conducted on 30 participants with a mean age of 35.6 ±

5.89(mean ± SD). The participants were divided into two groups; Group A received McKenzie Technique with ICT and Group B received Conventional Exercise with ICT for 1 session/day and 5 days/week for 4 weeks. In this study NDI, NPRS, Cervical Muscle Strength, and Endurance were used as outcome measures. The results showed a significant improvement in the outcome measures in the post-treatment stage as compared to the pre-treatment stage.

Though a significant improvement was found after treatment in both the groups, Group A showed greater improvement in the NDI Score, NPRS Score, Cervical Muscle Strength, and Endurance. (p-value < 0.05).

Thus, the Alternate Hypothesis [H₁], [H₂], and [H₃] is failed to reject.

The limitations of the study were that it involves a small sample size. So further the same study can be performed with a large sample size with different outcome measures to find the long-term follow-up.

5. CONCLUSION

The study concluded that McKenzie with ICT shows greater improvement in reducing pain and disability, improving cervical muscle strength and endurance compared to Conventional exercise with ICT.

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