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Combined Effect of Kinetics Exercises and Manual Therapy on Radiating Pain and Numbness for Cervical Radiculopathy: Case Study

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Abstract: ***Background**: Cervical radiculopathy is a neurological disorder caused by compression or irritation of cervical nerve roots, resulting in neck pain, radiating arm pain, numbness, muscular weakness and functional restrictions Symptoms are usually managed with conservative physiotherapy including manual therapy and therapeutic exercises. **Objective**: To investigate the combined effect of kinetic exercises and manual therapy on radiating pain, numbness, cervical range of motion, muscular strength and functional activities in a patient with cervical radiculopathy **Description of the case**: A 20-year-old female student has had neck ache radiating to her left upper limb for 4-5 years, which has been worsening in the last few months. She also reported trouble picking up objects, numbness and weak hands. Clinical findings were suggestive of cervical radiculopathy. **Intervention**: The patient received a 4-week physiotherapy program that included cervical chin tuck exercises, scapular retractions, shoulder rolls, manual median nerve mobilization, and passive cervical range-of-motion exercises. **Results**: After 4 weeks, the patient's neck pain, radiating pain and numbness were significantly reduced. There was improvement in cervical range of motion, hand grip strength, muscle strength, posture and functional activities without worsening of symptoms. **Conclusion**: The patient suffering from cervical radiculopathy experienced a successful alleviation of pain and neurological symptoms along with increased mobility and strengthening of the neck. While the results suggest that the combination of physiotherapy can be a useful conservative therapy, more research is necessary to support these conclusions.*

Keywords: neural mobilization, kinematics exercises, physical therapy, radiating pain, numbness, and cervical radiculopathy.

1. Background

Introduction

Cervical radiculopathy is a disease which is caused by the irritation or compression of one or more nerves running through the neck. Osteophyte, degeneration of cervical spine, herniated intervertebral disc, and stenosis of intervertebral foramina can cause it. This disease will cause pain along the nerve root course that runs from neck towards shoulders, arm or even hands.

Radiculopathies are the lesions of the dorsal and ventral roots or the spinal roots resulting from both of them. Radiculopathies can have different causes and appearances. Radiculopathies often affect one nerve root due to mechanical reasons such as herniated spinal disk.

Radiculopathies are lesions of the dorsal and ventral roots or the spinal roots they form. Radiculopathy has multiple etiologies and patterns of involvement. Structural causes, such as herniated spinal disks, usually affect one nerve root.

The C6 or C7 nerve roots are involved in two-thirds of cases of cervical radiculopathy. Cervical radiculopathy is due to compression or chemical irritation of a spinal nerve root. The most common causes of impingement in the young are trauma and herniation, usually in the third and fourth decades. In the fifth and sixth decades of aging, degenerative disc degeneration is the most frequent cause. Seventh decade: foraminal narrowing secondary to arthritis.

The cervical radiculopathy are less frequent than lumbar radiculopathy, the C7 nerve root is most frequently hit, with more than half of all cases impacting this level. Roughly a fifth of cases involve the C6 nerve root. Nerve roots C1 to C5 & C8 are less damaged. Risk factors developing radicular illness include manual labor with hard lifting, driving or operating vibrating equipment. Chronic smoking history can raise the risk of radiculopathies. A recent systematic assessment of 9 observational studies gives a thorough estimation of the burden of adult cervical radiculopathy. Pooled data from 2 high-quality cohorts & 7 lower-quality cohorts suggested an annual incidence of around 0.8 to 1.8 new cases per 1000 person-years. Point prevalence had significantly more varied range 1.8 to 5.8 per 1,000 in four studies of medium to high quality

Patients with cervical radiculopathy frequently experience neck pain, tingling, numbness, muscle weakness, and decreased upper limb reflexes. Neck motions that may worsen discomfort include rotation, extension and prolonged poor posture. Most commonly affected nerve roots are C5, C6 and C7.

Risk factors include poor posture, repetitive neck motions, prolonged computer or mobile use, trauma, aging and degenerative changes of the cervical spine. The diagnosis is made by imaging examinations such as X-rays, MRIs, or CT scans, as well as specialist testing like Spurling's test and neurological evaluation. The conservative management of cervical radiculopathy includes physical therapy, pain management, correction of posture, cervical stabilization exercises, traction, and activity modification. Severe or progressive neurological problems may require surgery.

Physiotherapy is needed to reduce discomfort, improve cervical mobility, strengthen the muscles of the neck and shoulders, correct posture and restore functional activities. Early management and appropriate rehabilitation improves quality of life and prevents recurrence of symptoms

Epidermiology: Most cited study was the epidemiology of cervical radiculopathy in Rochester, Minnesota from 1976 to 1990. In the study by these authors, the annual incidence of

cervical radiculopathy was 107.3 per 100,000 men and 63.5 per 100,000 women. A more recent US military study reported that cervical radiculopathy occurs more frequently in the fourth and fifth decades of life with an incidence of 1.79 per 1000 people per year

Prevalence: Cervical radiculopathy is a common cause of neck pain in IT workers. According to the inclusion criteria and statistical analysis, 92 samples were selected. Then foraminal distraction and Spurling tests of 46 samples were passed . The total prevalence was 50 %. Of the 92 participants, 39 (42.4%) reported a neck disability percentage of more than 22%, which was severe and interfered with their daily activities. The subjects' ages ranged from 25 to 50 years, with 64.1% being below 35 years and 35.9% above 35 years and below 50 years.

Aim: the goal of treatment for a patient with cervical radiculopathy is to assess and treat the patient to relieve discomfort, improve cervical range of motion, strengthen muscles, relieve symptoms of nerve root compression, and restore function, activities, and quality of life.
Assess relieve neck and left shoulder pain.
Evaluation relieve radiating pain and numbness of the left upper limb.
Evaluation make the cervical region more flexible.
Assess the strengthen the grip and muscles of left hand.
Assess the improve posture and practical activities.
Evaluation help prevent the symptoms from worsening or returning.

Case description of assessment: A 20-year-old female student presented with neck, left shoulder, and left upper limb pain. Cervical extension decreases the discomfort of cervical flexion. The patient also reports trouble holding objects, numbness of the left hand, and weakness of the hand. The symptoms have been there for 4 or 5 years but have gotten much worse since January. The discomfort has increased and is affecting everyday functional activities affecting the left upper extremity.
The results of the examination reveal radiating pain, paresthesia and paralysis of the left upper limb due to involvement of the cervical nerve root. The symptom pattern is consistent with cervical radiculopathy. Records of past and current medical care indicated treatment for migraine and eosinophilia. No other medical or surgical records of note were kept.

Study uniqueness: The present study is unique as it evaluates the combined effect of kinetic and therapeutic activities in a female patient (age 20 years) with a history of migraine, eosinophilia, and persistent symptoms for four to five years, on the radiating pain and numbness. There was improvement in cervical range of motion , muscle strength and functional activities after 4 weeks of physiotherapy intervention and reduction in discomfort and numbness.

2. Interventions

1) Neck retraction methods such as chin tucks:
Patient position: The patient sits in a chair with their back supported and their feet flat on the floor
Therapist position: the patient might be standing or sitting near the therapist.
Method: Ask the patient to pull the chin back to create a double chin without raising or lowering the head. Press and hold then release.
Timing: Hold for 5 to 10 seconds
Repitation: 2 or 3 sets of 10 reps.
Goals: The aims are to relieve nerve root compression, to reduce neck pain and radiating symptoms,

2) Shoulder Rolls:
Patient Position: Either standing or sitting
Therapist position: The therapist and the patient must be close.
Producer: If the patient is comfortable, ask him to roll both shoulders in a circle slowly backward and forward.
Duration: 1-2 min
Repitation: do ten circles, forward and backward.
Goal: the objectives are to improve relaxation, lessen muscular tightness, and increase shoulder flexibility.and to improve cervical posture.

3) Scapular retraction:
Position of the patient: standing or sitting with arms at ease
Therapist position: The therapist is behind the client.
Method: The patient is instructed to pull his shoulder blades together and slightly down without raising his shoulders.
Timing: Hold 5-10 seconds
Repitation: two sets of ten to fifteen reps
Goals: The aims are to enhance posture, strengthen the scapular stabilizers and reduce

4) Manual Neural Mobilization (Median Nerve Glide)
Patient position: Patient is supine
Therapist position: therapist is beside the patient.
Method: The therapist gently glides the median nerve by moving the wrist, fingers, elbow, and shoulder within a pain-free range.
Time: 2-3 x
Repeats: 10-15 seconds
Goals: The goal is to reduce tingling, numbness, and radiating discomfort.

5) Cervical Passive Range of Motion (PROM)
Patient position: supine.
Therapist position: The therapist's role Inside the patient's head
Method: Gently and painlessly rotate, flex and extend the neck
Repetitions: Do 10 reps in each direction.
Goals: The goal is to reduce stiffness, while maintaining cervical mobility.

The result: After four weeks of combined manual treatment and kinetic exercises, the patient's neck and shoulder pain, radiating symptoms, tingling and numbness improved significantly. The deep cervical flexor and scapular muscles showed improvement in activation, postural alignment, hand grip and upper limb muscle strength. Overall there was no deterioration in symptoms and an improvement in functional ability and quality of life.

Outcomes Measure:

Outcomes measure	Pre-physiotheapy	Post-physiotherapy
Pain (VAS 0-10)	8/10	2/10
Radiating pain (VAS 0-10)	7/10	2/10
Neck disability index	38/50(76%)	14/50(28%)
Cervical flexion	30°	45°
Ccervical extension	40°	60°
Right rotatio	50°	75°
Left rotation	45°	72°

3. Discussion

This patient with cervical radiculopathy was successfully relieved of neck pain, radiating pain and numbness with combination of manual treatment and kinematics exercises. Median nerve gliding and passive cervical range of motion exercises were effective in increasing mobility and decreasing nerve irritation, whereas cervical retraction and scapular exercises were effective in improving posture and cervical stability. Furthermore, the therapies resulted in improvements in hand grip, muscle strength, and functional activities. In conclusion, these findings support manual therapy combined with exercise as an effective conservative physiotherapy intervention for symptoms and function of cervical radiculopathy.

In conclusion: This case report shows that a patient with cervical radiculopathy has less neck pain, left shoulder pain, radiating pain and numbness after a four-week physiotherapy program of mechanical exercises and manual treatment. Improvement of posture, hand grip, upper limb muscle strength, cervical range of motion and functional activities was observed after treatment. Exercise therapy and manual techniques combined with early physiotherapy management can improve quality of life, reduce recurrence, and improve symptoms safely and effectively. Further research with larger sample sizes and longer periods of follow-up is recommended to support these findings.

References

[1] Alshami MA, Bamhair DA. (2021). “Effect of manual therapy with exercise in patients with chronic cervical radiculopathy: a randomized clinical trial.” Trials, 22, 716.
[2] Rafiq S, et al. (2022). “Comparison of neural mobilization and conservative treatment on pain, range of motion, and disability in cervical radiculopathy: A randomized controlled trial.” PLOS ONE.