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"Comparison Between Nerve Mobilization And Conventional Physiotherapy In Patients With Cervical Radiculopathy."

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Abstract:
Background and Purpose: In the younger population, cervical radiculopathy is a result of a disc herniation or an acute injury causing foraminal impingement of an exiting nerve. Neuromobilization is one of the many methods of manual therapy of soft tissue conditions, and more specifically, neural tissue and tissues surrounding the nervous system. Based on the previous studies, the present study was focused on the effect of nerve mobilization and conventional physiotherapy in improving pain in patients with cervical Radiculopathy Methodology: this research was experimental design to compare nerve mobilization and conservational physiotherapy in patients with cervical radiculopathy. 20 patients of cervical radiculopathy, aged 25-40 years, affected for more than 4 weeks and of either sex conveniently included in the study. Initially, all the subjects were assessed for pain by VAS. Following the principle of randomization, the subjects were allocated into two groups. Group A received nerve mobilization for radial, medial and ulnar along with cervical traction while Group B received conventional physiotherapy which include cervical traction, hot pack and isometric strengthening exercises for cervical. Reassessment was done after 4 weeks of treatment program.
Result: The analyses of significance was carried out by using Unpaired t- test to compare the effectiveness of nerve mobilization treatment on pain as compared to conventional physiotherapy Results were found to be significant for t- value at p-value 0.05
Conclusion: It can be concluded that both the intervention are effective therapeutic options in the treatment of cervical radiculopathy. This result shows that treatment given to patients in Group A is more effective than that of Group B i.e. nerve mobilization is more beneficial in improving the pain in patients with cervical radiculopathy.

Key words *: Nerve mobilization, conventional physiotherapy, cervical radiculopathy*

1.Introduction

Cervical radiculopathy is one of the most common health related complaints. Cervical radiculopathy is a common clinical diagnosis classified as a disorder of a nerve root and most often is the result of a compression or inflammatory pathology from a space occupying lesion such as disc herniation, spondylitic spur, or cervical osteophyte. [(1)] The average annual incidence rate of cervical radiculopathy is 83 per 1000 for the population in its entirety, with an increased prevalence occurring in the fifth decade of life (203 per 1000). The most frequently involved nerve roots are the cervical 6 (C6) and cervical 7 (C7) cervical roots which are typically caused by C5-C6 or C6-C7disc herniation or spondylosis. [(2)] It's estimated that 50% of the population will experience neck and upper extremity pain at some time in their lifetime. [(3)]

The location and pattern of symptoms will vary, depending on the nerve root level affected, and can include sensory and/or motor alterations if the dorsal and/or ventral nerve root is involved. Although patients with cervical radiculopathy may have complaints of neck pain, the most frequent reason for seeking medical assistance is arm pain. Patients usually present with complaints of pain, numbness, tingling, and weakness in the upper extremity, which often result in significant functional limitations and disability. Physical therapy programmes play a significant role in the treatment and improvement of symptoms in patients with cervical spine disorders. Nonsurgical treatment for cervical radiculopathy includes short-term use of a soft, cervical collar, traction, medications. Manipulation, physical therapy, and steroid injections are also part of a conservative plan of management. Of physical therapy interventions, cervical traction has been considered as a therapy of choice for patients with cervical radiculopathy. Neuromobilization is one of the many methods of manual therapy of soft tissue conditions, and more specifically, neural tissue and tissues surrounding

the nervous system. Neuromobilization is a set of techniques designed to restore plasticity of the nervous system, defined as the ability of nerve-surrounding structures to shift in relation to other such structures. Moreover, it contributes to restoring the ability of neural tissue itself to stretch and tension, and stimulates the reconstruction of normal physiological function of nerve cells. [4]

A multitude of physical therapy interventions has been proposed to be effective in the management of cervical radiculopathy, including mechanical cervical traction, manipulation, therapeutic exercise, and modalities.

But no study has directly compared the two different treatment procedures nor has seen the effect of nerve mobilization in comparison to conventional physiotherapy. The study aims to investigate the efficacy of nerve mobilization in combination with cervical traction in cervical radiculopathy patients.

2.Methodology

2.1.Participants

This study was experimental in design and comparative in nature. The sample used in this study was a sample of convenience. Research was done in Physiotherapy department, Lovely professional university, Phagwara and Divya Jyoti Jagrati Sansthan Nurmahal . 40 patients with unilateral radiculopathy had been referred by a physician for outpatient physical therapy evaluation and intervention were selected for the study. They were consecutive patients who agreed to participate and fulfilled the inclusion criteria.

2.2.Inclusion Criteria

The patients were included according to the following criteria:-

- Subjects fulfilling the Wainner et al, [5] clinical examination criteria
- Subjects with age 25-45 years
- Patients having pain for more than 4 months
- Radiating pain in at least one upper limb.

2.3.Exclusion Criteria

- Traumatic injuries of upper limb and cervical spine
- Dizziness
- Patients asymptomatic for pain but symptomatic for tingling and paraesthesia
- Circulatory disturbances of upper extremity
- Known history of high level Spinal cord injury and malignancy

2.4.Procedure

The subjects were assessed according to Wainner et al,[5] clinical examination criteria and those fulfilling this criteria were included into the study. Patients were then asked to sign the consent form and give their will regarding being enrolled in the study.

Assessment of all the included subjects was done as per the assessment form. During the assessment the parameter assessed was intensity of pain using the Visual Analogue Scale. The pain was recorded by 10 cm horizontal visual analogue scale (VAS), the participant was asked to mark their intensity of pain on a 10 cm long line in the data collection sheet with 0 to 10 where 0 symbolized no pain and 10 was severe pain.

After initial assessment the 40 subjects were divided into two groups Group A and Group B.

2.5.Treatment Regime For Group A

- Cervical traction for 20 minutes 7% of body weight with 7 seconds hold time and 5 seconds rest time.
- Nerve mobilization on the basis of butler concept was given. The treatment sequence for median, ulnar, radial nerves were :

Median Nerve: Glenohumeral abduction, wrist extension, supination, glenohumeral lateral rotation, elbow extension, neck lateral bending to opposite side.

Radial Nerve: Glenohumeral depression, elbow extension, whole arm internal rotation, wrist flexion

Ulnar Nerve: Wrist extension, forearm pronation elbow flexion, glenohumeral lateral rotation, glenohumeral depression, shoulder abduction

Three sets of ten repetitions in each set, at a moderate pace and a three second hold at the final stretched position.

2.6.Treatment Regime For Group B

- Cervical traction for 15 minutes 7% of body weight with 7 seconds hold time and 5 seconds hold time.
- Moist pack was given for 15-20 minutes over the cervical region.

Isometric strengthening neck exercises with 25 repetitions in each direction with 7 seconds hold and twice a day.

The total duration of the treatment program was 4 weeks with 4 sittings per week. The reassessment was done at 4 weeks and the parameters assessed was intensity of pain using the Visual Analogue Scale

3.Data Analysis

The paired t - test was employed to compare the mean difference in both the groups. The significance (Probability –p) was selected as 0.05.

4.Results

VAS	Group A		Group B	
	Mean	SD	Mean	SD
Pre	6.80	1.54	6.25	1.25
Post	3.35	1.49	4.45	1.63

Table 1: Mean And SD Of VAS For The Group A And Group B
The Unpaired T-Test Result Were Found To Be Significant For T- Value At P-Value 0.05

Mean diff. (Pre – Post)	Group A Vs Group B	
	t value	P value
VAS	5.89	P < 0.05

Table 2: Comparison Of Difference Of Mean Values Of Pre And Post Interval For Visual Analogue Scale Between Group A And B

5.Discussion

The results of the present study reported that the combination of nerve mobilization and cervical traction may be useful for patients with cervical radiculopathy. Though improvement was also seen in the other group receiving conventional physiotherapy but improvement in VAS and NDI was more in the nerve mobilization group.

These results are in accordance with the work done by Donald R. Murphy et al in which he did a study on 31 patients with cervical radiculopathy who received a non surgical approach which included manipulation, mobilization and exercise therapy. [6] Disability was measured using the Bournemouth Disability Questionnaire and pain intensity was measured using the Numerical Pain Rating Scale. The mean percentage of improvement in the Bournemouth Disability Questionnaire score was 78%. The mean percentage of improvement in the Numerical Pain Rating Scale score was 72%.

The significant improvement due to nerve mobilization can be due to following explanation. It is hypothesized that these therapeutic movements can have a positive impact on symptoms by improving intraneural circulation, axoplasmic flow, neural connective tissue viscoelasticity, and by reducing sensitivity of AIGS [7,8], but these biologically plausible contentions have not been validated. These techniques may also be able to reduce unwanted fear of movement when provided in conjunction with appropriate neurobiology education, and therefore, they may reduce the reactivity of the pain neuromatrix [7]. The mobilization of nerve roots increases their elasticity and is conducive to rearrangement of the area of the intervertebral disk convexity.

In summary, the application of neuromobilization in musculoskeletal conditions is effective provided that the patient is properly diagnosed and the pathology is functional. Neuromobilization procedures should be performed in musculoskeletal system diseases on condition that the results of tension and mobility tests are positive. Different musculoskeletal conditions require condition specific neuromobilization techniques. It must be borne in mind that neuromobilization is a component of conservative treatment and should not be used in monotherapy but included in a therapeutic regimen together with other physiotherapeutic procedures and pharmacotherapy.

In this study intensity of pain was measured using VAS. There was significant improvement in both the groups but more clinically meaningful changes were seen in the nerve mobilization group which is in accordance with the work done by Donald Murphy et al who did a study on lumbar spinal stenosis patients receiving neural mobilization and distraction manipulation. [9] There was a 3 point change in the Numeric Pain Rating Scale.

6.Limitations

- There was an absence of randomization in sampling method.
- The nerve mobilization treatment program was not specific to any single specific nerve.
- No previous treatment was considered in both groups.
- The sample size was small.
- There was no long term follow up.

7.Recommendations

- Further study can be done on effects on nerve mobilization in lower limb radiculopathy.
- Population can be taken gender specific in future study.
- A comparative study can be done between nerve mobilization and other manual therapy techniques.

8.References

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