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A Comparative Study on the Effectiveness of Transcutaneous Electrical Nerve Stimulation with Neural Mobilization versus Interferential Therapy with Neural Mobilization in the Management of Neck Disability among Subjects with Cervical Radiculopathy

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Abstract: ***Background of the study: Cervical radiculopathy is the dysfunction of a nerve root in the cervical spine, is abroad disorder with several mechanism of pathology and it affect people of any age. Cervical radiculopathy is most commonly for ages between 40 to 50. Twenty six to seventy one percent of the adult population experienced an episode of neck pain at some point in their lifetime. Various physiotherapy approaches are available to treat the patients with cervical radiculopathy. This study was an attempt to find and compare effectiveness of*** **transcutaneous electrical nerve stimulation** ***(TENS) with neural mobilization and interferential therapy (IFT) with neural mobilization on neck disability in subjects with cervical radiculopathy. Objective of the study: The objective of the study was to find and compare the effectiveness of TENS with neural mobilization and IFT with neural mobilization on neck disability in the subjects with cervical radiculopathy. Methodology: 30 patients with cervical radiculopathy were selected based on the inclusion and exclusion criteria. They were randomly allocated into two groups A and B, consists of 15 subjects each. Group A received TENS with neural mobilization and group B received IFT with neural mobilization. Intervention lasted for 2 weeks, five days in a week. Neck disability was measured by neck disability index before and after 2 weeks of intervention. Conclusion: Two weeks of TENS with neural mobilization is more effective than IFT with neural mobilization in improving neck function among cervical radiculopathy patients.***

Keywords: Cervical radiculopathy, TENS, Neural mobilization, IFT, Neck disability index

1. Introduction

Cervical radiculopathy is a condition caused by the compression of the nerve root in cervical spine that commonly manifests as neck pain and it may also radiate from the neck into the distribution of the affected nerve root. It is the result of compressive or inflammatory pathology from a space occupying lesion such as a disc herniation, spondylitic spur or cervical osteophyte. Cervical radiculopathy has an annual incidence rate of 83.2 per 100, 000 in the general population. It might be unilateral or bilateral. The most frequently involved nerve roots are the C5 and C6 nerve roots which are typically caused by C5-C6 or C6-C7 disc herniation or spondylosis [1]. Patients usually present with complaints of pain, numbness, tingling and weakness in the upper extremity which often result in significant functional limitations and disability [2]. Provocative tests to assist in the diagnosis of cervical radiculopathy include the Spurling test, the shoulder abduction test, Valsalva maneuver, Neck distraction, and Elveys upper limb tension test (ULTT) [3, 4].

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 [5]. Unlike patients with axial neck pain, patients with radiculopathy usually present with unilateral pain. The pathoanatomy of cervical radiculopathy involves compression of the cervical nerve root [6]. Thus the purpose of the study is to find and compare the effect of TENS with neural mobilization and IFT with neural mobilization on neck disability among cervical radiculopathy.

2. Methodology

Review Board of Jaya College of Paramedical sciences, College of Physiotherapy, Chennai has approved this two group pre and post-test experimental study and a written consent was obtained from the participants after giving clear instructions regarding the treatment procedure and its implications.

Thirty cervical radiculopathy patients age between 25to 30 were selected for the study and randomly assigned into

anyone of the experimental groups. Group A fifteen subjects received TENS with neural mobilization. Group B fifteen subjects received IFT with neural mobilization. Intervention lasted for five days in a week and the same was continued for 2 weeks. Neck disability was measured before and after 2 weeks of intervention by neck disability index. All extraneous variables were clearly identified and ruled out from the study.

Figure 1: Application of TENS

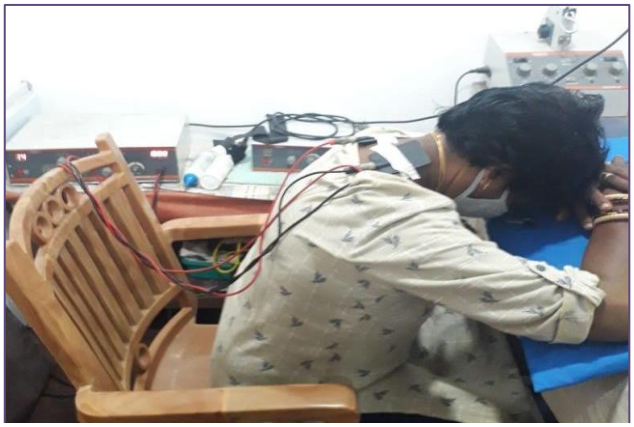

Figure 2: Application of IFT

Figure 3: Neural Mobilization

3. Data Analysis and Results

The study aims to find and compare the effectiveness of TENS with neural mobilization and IFT with neural mobilization on neck disability in subjects with cervical radiculopathy.

Table 1: Mean value, Mean Difference and Paired 't' value of neck disability among group A and B

Group-A	Mean	Mean difference	SD	Paired 't' value
Pre test mean	52.40	14	3.79	27.11*
Post test mean	38.40		3.22	
Group-B	Mean	Mean difference	SD	Paired 't' value
Pre test mean	51.47	8.67	6.75	10.56*
Post test mean	42.80		5.65	

In group A and B for neck disability the calculated paired 't' values are 27.11 and 10.56 respectively and the 't' table value is 16.55 at 0.005 level. Since both the calculated 't' values are more than the 't' table value, there is significant difference between pre and post test scores of neck disability in both the groups. That is neck function is improved following both TENS with neural mobilization and IFT with neural mobilization in subjects with cervical radiculopathy.

Table 2: Mean value, Mean Difference and UnPaired 't' value of neck disability among group A and B.

S. No	Groups	Improvement		Standard deviation	Unpaired 't' test
		Mean	Mean Difference		
1	Group-A	-14	-5.33	3.18	-5.50*
2	Group-B	-8.67			

4. Discussion

In the present study both TENS with neural mobilization and IFT with neural mobilization in subjects with cervical radiculopathy. **Subhash Chandra Rai** *et al., (*2013) concluded that the highly reduction in the pain could be due to the analgesic effects of TENS. In TENS pain gate theory work. The possible mechanism of non acute pain relief by low rate TENS at motor level stimulation is peripheral block or activation of central inhibition [7]. **Eubanks** *et al.*, concluded the improvement could be because of Neural Mobilization Techniques that used to normalize the CNRs (cervical nerve root) structure and function via the possible reduction of nerve adherence, facilitation of nerve gliding and decreased neural mechano sensitivity [8]. **Fuentes** *et al.*, in 2010 in a systematic review and meta-analysis reported that Interferential current as a supplement to another intervention seems to be more effective for reducing pain [9].

5. Conclusion

Both TENS with neural mobilization and IFT with neural mobilization are effective in improving neck function in subjects with cervical radiculopathy. When comparing both TENS with neural mobilization is more effective than IFT with neural mobilization in improving neck function among the subjects with cervical radiculopathy.

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