

Review Article**A study on short term effect of Transcutaneous Electrical Stimulation (TENS) on pain and disability in patients with cervical brachialgia**Dr. Kapil Rastogi¹ Dr. Gaurav PratapTyagi²

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Abstract

Objective: The purpose of this study was to find out the effect of TENS on pain and disability in patients with cervical brachialgia. **Materials and methods:** The total number of patients was 30. The participants were selected on the basis of inclusion and exclusion criteria. Before including the patients in this research, consent form was taken from each patient. The patient's were evaluated at 1st day and 21st day respectively in terms to analyze the effectiveness of the protocol that was delivered to the patients. **Statistical analysis:** All data analysis was obtained using SPSS version 20.0. Base line data of the patients including pain and disability were summarized. The dependent variables for the statistical analysis were VAS and NDI score for pain and disability. Paired t-test was used in this study to obtain the difference between the pre and post score of VAS and NDI. A level of significance 5% was used to determine the p-value. **Result:** There was significant difference found between pre and post score of VAS and NDI from 1st to 21st day. On the basis of findings of baseline data and t-test analysis, there was significant improvement noticed in terms of reducing pain and disability at 1st and 21st day. **Conclusion:** After analyzing the data at two different visits i.e. 1st day and 21st day, this study concludes that the patients who received TENS along with moist heat pack and isotonic exercises of neck reported less pain and disability at 21st day.

Keywords:

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Introduction

Cervical brachialgia is referred neurogenic pain in the distribution of a cervical nerve root or roots, with or without associated numbness, weakness, or loss of reflexes. The usual cause in young adults is herniation of a cervical disk that entraps the root as it enters the foramen. Cervical brachialgia or upper limb referred pain can be due to pathologies of the joint and soft tissue in nerve compression. There is primary care physician has to entertain a wide differential when a patient is chief complains of pain referred in upper limb¹.

A careful and proper history and examination is required to differentiate causes of pain as well as possible. Although appropriate special investigation may required, they often cause confusion due to degenerative conditions it may be asymptomatic. The patients feel pain over the shoulder region among in whole upper limb in brachialgia. The purpose of this article was to find out the efficacy of TENS on pain and disability among the patient with cervical brachialgia. Cervical brachialgia has been estimated to be more prevalent than neck pain with radiculopathy arm pain in isolated. The chief complaint is commonly among the patient seeking physiotherapy intervention for cervical and upper limb pain. The occupation of most commonly patient is manual work with continuous computer work, writing, manipulating or moving objects and overhead weight lifting².

A clear understood of the onset and nature of pain may require. A cervical radiculopathy may be acute or chronic. The axial neck pain with radiate arm may reduce cervical range of motion. The causes of pain neck extension and lateral bending to the side of the pain. This is due to foraminal compression of cervical pain the higher cervical roots cause radiating pain into the occiput and posterior neck and shoulder. The cause by distal nerve roots are compression radiating pain down the arm. The mainly nerve roots are involve C5 typically radiates into the shoulder, with C6 involve by radiating to lateral elbow in the thumb. The cause of C7 roots compression posterior arm pain and into the middle finger, with C8 involving the little finger. The pain radiate in scapula might a feature that often confuses the situation and due to C7 root irritation³.

The patient of shoulder pathology may be occupation related and performs overhead work activity, or patient has recently performed unusual activity⁴. The local muscle spasm with the pain radiate down the arm and into the base of the neck. The patient's complaints are usually loss of range of motion and function. The pain be relieved by the arm elevation, cervical radiculopathy is more likely. In the severe case in neck pain the patient may hold the arm elevated with the unaffected arm in an effort to control the pain⁵.

The conventional method involves the use of electrical stimulation method for relieving pain. The most widely used of the frequency, low frequency stimulations, which mainly recruits method is undoubtedly Transcutaneous electrical nerve afferent fibres⁶. Stimulation which consists of stimulating the afferent vibratory stimulation (VS), which has been known for a long fibers in the painful part of the body by means of electrode placement on the time to have analgesic effects and commonly use by the physiotherapist the effect of vibration on experimentally induced pain also be tested. The results of the vibration can be a highly efficient means of alleviating pain involving the activation of large diameter afferent fibres⁷. The purpose of this study was to find out the effect of TENS on pain and disability in patients with cervical brachialgia.

Objective

To find out the effect of TENS on pain and disability in patients with cervical brachialgia

Hypothesis

Alternate Hypothesis (H1)

There will be significant effect of TENS on pain and disability in patients with cervical brachialgia

Null Hypothesis (H₀)

There will be no significant effect of TENS on pain and disability in patients with cervical brachialgia

Materials and methods

This is a quasi-experimental study. This study was conducted at Physiotherapy OPD, Jyoti Rao Phule Subharti College of Physiotherapy, Meerut. The total number of patients was 30. The participants were selected on the basis of inclusion and exclusion criteria. Before including the patients in this research, consent form was taken from each patient. The patients were evaluated at 1st day and 21st day respectively in terms of the finding the efficacy of the protocol that was delivered to the patients.

Inclusion criteria

Both male and female having age between 20-30 year, Duration of neck pain less than 1 month (Sub-acute), VAS score of more than or equal to 6, NDI score of more than or equal to 19 score

Exclusion criteria

Any Congenital anomalies like cervical rib etc., past history of cervical trauma, history of trauma or fracture in upper limb neck, patient suffering from Diabetes Mellitus, any Patient with history of recent surgery to neck or upper back., any patient with neurological complication and any patient with psychological complication were excluded.

Outcome measures

VAS (Visual analogue scale)⁸

The visual analog scale was utilized to measure the intensity of neck pain of patients with cervical brachialgia. It consists of a 10 cm line. The therapist can measure the place on the line and convert into it a score between 0 to 10 where 0 is no pain and 10 is bad as it could be .

NDI (Neck disability index)⁹

Neck disability index was used to determine the disability associated with the neck pain. The NDI is scored from 0–50 points (0–100%) in which higher scores correspond to greater levels of disability. Using this system, a score of 5–14 points (10– 28%) was considered to constitute mild disability, 15–24points (30–48%) was considered to constitute moderate disability, 25–38points (50–68%)was considered to constitute severe disability, and scores above 34points (68%) indicate complete disability.

Procedure

Initially, all patients were received moist heat pack (MHP) for 15 minutes. Neck area was monitored during application of MHP in terms of temperature of MHP, skin texture of targeted area and comfort level of patients. After application of MHP patients received exercises. Such as isotonic exercises of cervical spine with 5 repetitions each movement (flexion, extension, lateral flexion and rotations) were given to the patients.

TENS was given for the patients for 15 minutes, electrodes were placed over the neck posterior and affected upper limb either right or left side (anterior, posterior, medial and lateral) till the level of symptoms. The procedure was explained to the patients before implementation of TENS. The current to be applied at a pulse repetition frequency of 100Hz and duty cycle of 250s, the intensity will be set at a level that each subject should feel but will not be strong enough to induce muscle contraction. The procedure was given in form of 6 sessions in a week for 3 weeks.

Data Analysis

All data analysis was obtained using SPSS version 20.0. Base line data of the patients including pain and disability were summarized. The dependent variables for the statistical analysis were VAS and NDI score for pain and disability. Paired t-test was used in this study. A level of significance 5 %(*) was used to determine the statistical significant.

Result

Table-1, Showing the pre (on 1st day) and (21st day) and post VAS score

Outcome Measure	Time Period	Mean	S.D	S.E.M
VAS	1 st Day (Pre-VAS)	6.02	1.67	0.673
	21 st Day (Post- VAS)	2.67	1.73	0.714

Graph-1, showing the difference between pre and post VAS score

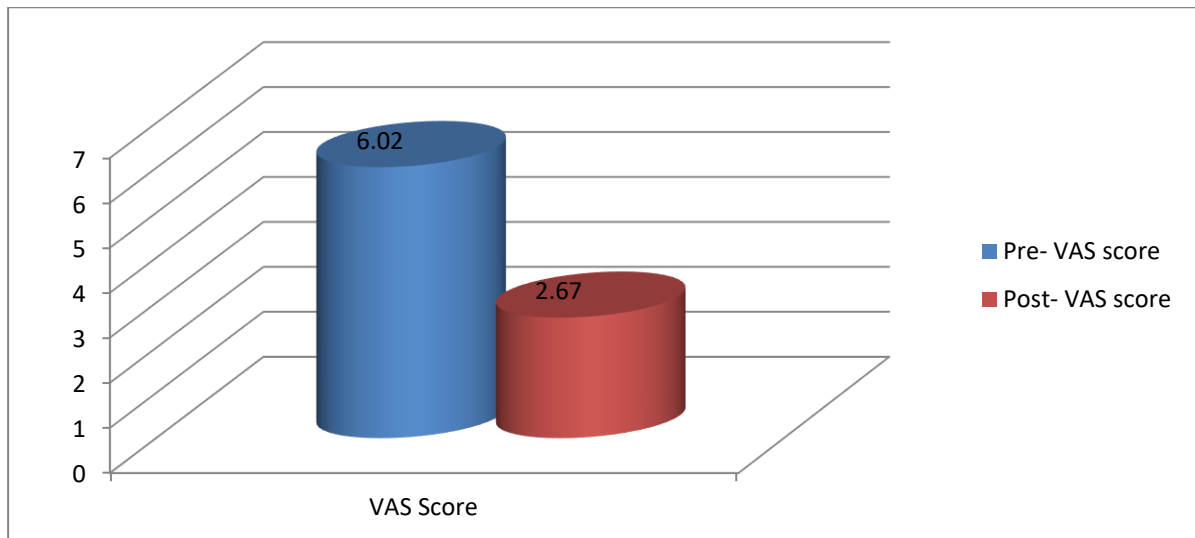


Table-1, showing mean, S.D and S.E.M at the pre (on 1st day) and post (21st day) NDI score

Outcome Measure	Time Period	Mean	S.D	S.E.M
NDI	1 st Day (Pre-NDI)	19.33	2.17	0.413
	21 st Day (Post-NDI)	6.63	1.69	0.437

Graph-2, showing the difference between pre (on 1st day) and post (on 21st day) NDI score

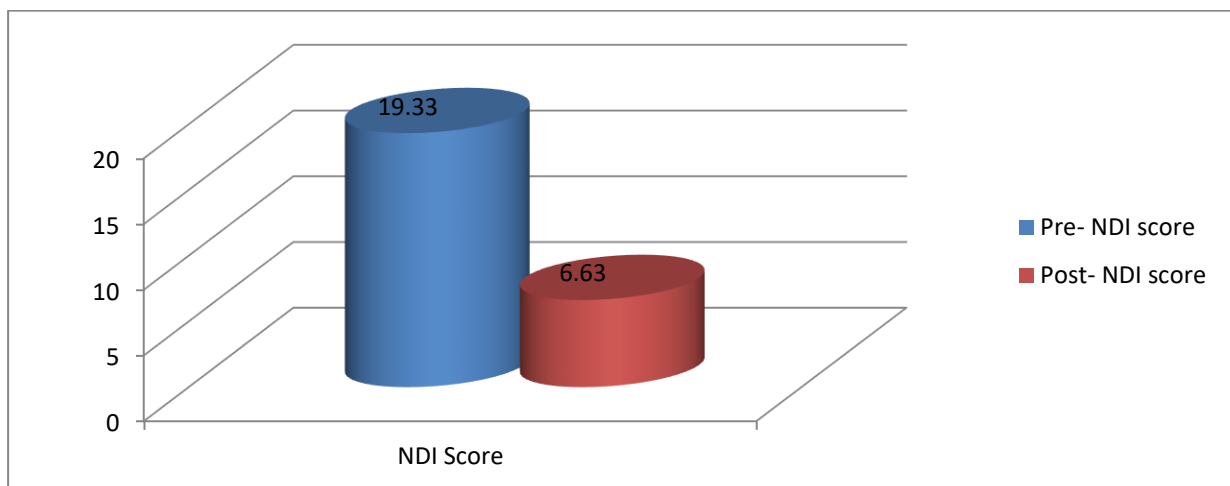


Table-3, showing t-test value and p- value of pre (1st Day) to post (21st Day) score of VAS and NDI

Outcome Measures	Time Period	t-value	p-value	Significance (Level of 5%)
VAS	Pre-Post VAS	13.74	0.002	Significant
NDI	Pre-Post NDI	11.67	0.001	Significant

Discussion

The purpose of this study was to find out the effect of TENS on pain and disability in patients with cervical brachialgia. This study provides data for pain and disability of individuals who had complain of neck pain which was radiating in nature. The data is sparse in between 20-30 year age group since it was convenient to find people in this age group who could fit the inclusion criteria in this study. In this study, data shows that there was significant difference in pre and post VAS score and NDI score in patients with cervical brachialgia. On the basis of findings, TENS is an effective protocol in reducing pain and disability in patients with cervical brachialgia. Data of VAS and NDI of pre and post experimental study are expressed in terms of mean, S.D and S.E.M is shown in table-1 and 2 respectively. Further application of paired t-test implemented (table-3) to find the significant difference between pre and post score of VAS and NDI which revealed significance difference at 5% level of significance. The 3 weeks protocol of TENS along with MHP and isotonic exercises was effective in order to decreasing the pain and disability.

A study was conducted by Mikhled Maayah et al on evaluation of Transcutaneous Electrical Nerve Stimulation as a treatment of neck pain due to musculoskeletal disorders. In their study thirty subjects with neck pain were randomly allocated to two groups, treated with either TENS (n = 15) or placebo (n = 15). Each subject received one session for one hour. All subjects were evaluated before, during treatment, after switch off and again a week after by using Myometer machine. All subjects completed the follow-up assessment. The assessments were compared and used to measure outcome treatment. Improvement in their condition was measured in terms of a reduction in the individual's level of pain during the week after the end of the first session. At the end of the first session, the study showed that 11 subjects (73%) in the treatment and 7 subjects (43%) in the control groups had gained marked improvement. These results are statistically highly significant, (P = 0.01) at the end of the follow-up assessment. Conclusion of their study could be drawn that a single intense TENS treatment is an effective treatment for neck pain due to musculoskeletal disorders¹⁰.

Another study was conducted by Himanshi Sharma et al on effectiveness of TENS versus intermittent cervical traction in patients with cervical radiculopathy. In their study, 30 patients with cervical radiculopathy were included and allotted equally into two groups i.e. group A and group B. Group A comprised of 15 patients with cervical radiculopathy were given TENS with isometric neck exercises and active neck movements. Group B comprised of 15 patients with cervical radiculopathy was given intermittent cervical traction with isometric neck exercise and active neck movements. VAS and NDI were used as outcome measures pre and post treatment. This study concluded that TENS was more effective in the management of cervical radiculopathy along with isometric neck exercise, in reducing both neck & arm pain, neck disability and in improving activities of daily living¹¹. On the basis of findings of previous literature related to efficacy of TENS in different disorders stated

that TENS has a significant effect in terms of reducing pain, disability and improving quality of life of patients with various musculoskeletal disorders. The findings of our study also suggested that TENS is a suitable electrotherapeutic approach which has an analgesic effect and helpful in relieving the symptoms and improving the quality of life of the patients with cervical brachialgia.

Conclusion

This study revealed that there was significant difference showed from pre (1st day) to post (21st day) VAS and NDI scores in patients with cervical brachialgia. After analyzing the data at two different visits i.e. 1st day and 21st day, this study concludes that the patients who received TENS along with moist heat pack and isotonic exercises of neck had less pain and disability as at 21st day. On the basis of findings of this study, this study states that there was significant difference noticed from pre (1st day) to post (21st day) score of outcome measures utilized to find out the result of the study. This study supports the experimental hypothesis.

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Conflict of interest: Nil

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