



Research Article

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# Effects of Acupressure & TENS along with Hot Pack in Neck Pain

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## Abstract

**Background:** There are various therapeutic interventions to treat neck pain like rest, moist heat, cryotherapy, cervical collar, postural education, neck exercises, strengthening exercises, ultrasound, TENS, IFT, SWD, US, PEME, EMS, cervical traction, cervical and thoracic spine manipulation/mobilization, and acupressure. Manual therapy has been known to supplement and contribute to other medical specialties. Apart from pain relief, TENS has been found to give rise to less pain interference with work, home and social activities, increased activity level and pain management and decreased use of other therapies including pain medication. Acupressure is usually applied in the management of pain, to balance body's energy and to maintain good health. It decreases muscular tension, enhances circulation and promotes deep relaxation. Acupressure also enhances body's immunity and that ultimately promotes wellness. To determine the effects of acupressure and TENS along with application of hot pack in neck pain.

**Methodology:** 40 subjects from Physical Therapy Department of Mamji Hospital, Karachi, who fulfilled the inclusion criteria, were included in the study. After taking informed consent from all the participants, the patients were randomly assigned into two groups, Group A and Group B, 20 patients in each group.

- i. Group A: TENS Group
- ii. Group B: Acupressure Group

Both groups received interventions in 18 sessions over 6 weeks, 3 sessions per week. The pre-assessment was done at 1<sup>st</sup> day while post-assessment was done at 6<sup>th</sup> week. Pre and Post treatment assessment parameters were taken through Numeric Rating Scale (NRS) and Neck Disability Index (NDI) from both groups. NRS was used to measure the intensity of pain.

**Results:** Data was stored and analyzed through SPSS version 22.0, mean and standard deviation of the samples were estimated at pre and post stage of study and to examine the effect of pre and post pain score paired sample t-test was used, p-value less than 0.05 were considered as the significant level to declare the statistical significance of the results. The results showed that, both TENS and Acupressure effect significantly on pre and post pain score with p less than 0.01, the pre-treatment pain of Acupressure was 6.95 and TENS was 6.80. The post-treatment pain of Acupressure was 3.60 and TENS was 5.0. Acupressure showed better effects in post pain score as compared to TENS.

**Conclusion:** At the end of 6<sup>th</sup> weeks of treatment, both group showed a significant reduction in pain, but the efficacy of TENS is less when compared to Acupressure i.e. Group A patients showed more improvement in post treatment than compare with Group B.

**Keywords:** Neck Pain; Pain; TENS; Acupressure; Neck Disability Index; Intensity; Numeric Rating Scale

**Abbreviations:** NRS: Numeric Rating Scale; NDI: Neck Disability Index; IASP: International Association for the Study of Pain; TENS: Transcutaneous Electrical Nerve Stimulation

## Introduction

**The concept of Pain:** Pain has been defined by the International Association for the Study of Pain (IASP) as: "An unpleasant sensory and emotional experience associated with

actual or potential tissue damage, or described in terms of such damage [1]. Neck pain is one of the most common musculoskeletal disorders. The main feature of neck pain is pain in the cervical

region which is often accompanied by other complaints as restriction of the range of motion and/or functional limitations [2]. Often the neck pain is precipitated or aggravated by neck movements or sustained positions. Besides pain and stiffness, symptoms as for example, headache, brachialgia or dizziness may also be present. There is no conclusive evidence regarding specific pathology in the majority of cases for acute or chronic neck pain. The pain can originate from many structures in the cervical region. Consequently, most cases are labelled as non-specific neck pain or neck pain of unknown origin [3].

Acupressure is an ancient healing art using the fingers to gradually press key healing points, which stimulates the body's natural self-curative abilities. Acupressure was developed in Asia over 5,000 years ago. Using the power and sensitivity of the hand, Acupressure Therapy is effective in the relief of stress-related ailments, and is ideal for self-treatment and preventive health care for boosting the immune system. Acupressure releases tension, increases circulation, reduces pain, and develops spirituality and vibrant health [4]. Acupressure is a noninvasive technique that may prove to be a useful adjunct in the care of a wide variety of individuals with symptoms [5]. Acupressure points (also called potent points) are scattered on the body that are especially sensitive to bioelectrical impulses in the body and conduct those impulses readily. Traditionally, Asian cultures perceived that acupoints are the junctions of special pathways which are present in body that carried the human energy. Chinese called this energy as "chi" whereas Japanese called it as "ki". The scientists have also mapped out and proven the existence of this system of body points by using sensitive electrical devices [6].

Stimulating these points with variable pressure triggers the release of *endorphins*, which are the neurochemicals that relieve pain. As a result, pain is blocked and the flow of blood and oxygen to the affected area is increased. This causes the muscles to relax and promotes healing. As acupressure inhibits the pain signals sent to the brain through a mild, fairly painless stimulation, it has been described as closing the "gates" of the pain-signaling system, preventing painful sensations from passing through the spinal cord to the brain [6]. Neck pain is commonly associated with muscle spasm of musculature. Acupressure is often successful in relieving neck pain [7]. Tender points located on the trapezius muscles are consistent with local acupuncture points such as "Jianjing" (GB 21), "Jianwaishu" (SI 14), and "Jianzhongshu" (SI 15) and are applied to massage therapy in patients with chronic neck pain. On the other hand, distal traditional acupuncture points, "Hegu" (LI 4), "Shousanli" (LI 10), and "Quchi" (LI 11), are contained in the Large Intestine Meridian of Hand-Yangming and are suggested to be the points for improving neck-shoulder-arm disorders in the Chinese/Japanese traditional medicine [8].

Acupressure alleviates wide range of conditions ranging from immune ailments to emotional disorders. It is a complementary

treatment which effectively relieves diverse pain while managing multiple symptoms in a variety of patient [9,10]. Both, acupuncture and acupressure are effective, safe, simple and economical therapies but acupressure is more easy and people-compliant due to its non-invasive and needle free nature [11,12]. Acupressure is more compatible to pharmacotherapy due to ease of self-administration. It plays a vital role in pain restoration, promotion of psychological well-being as well as patients' quality of life [13]. Those people who are not comfortable with needles or when there is need of stimulating more delicate acupoints, acupressure therapy is preferred. Acupressure assists the practitioner to identify the specific acupoints prior to acupuncture with needle.

The best thing about acupressure is that it is safest, gentle and emotional touch for promoting the wellbeing in human population. From last few decades, CAM has fascinated the global health practitioners as well as patients due to several reasons including ease of application, effectiveness, economic aspects and many more. CAM therapies are the real cultural specific remedies practiced throughout the world. Acupressure is a non-invasive and non pharmacological intervention with multidimensional roles and benefits. Current investigations substantiate the traditional claims and validate use of acupressure for painless treatment in numerous diseases. Present review appraised the different patented devices and practices with applications in the therapy of various acute and chronic ailments. With modern devices, one can tune intensity of the pressure also. In addition to pain-relief, acupressure devices offer generous advantage of absence of drugs, and consequently, no after adverse effects. To support acupressure (CAM) and to expand CAM therapies in the near future and expand CAM therapies, we have to shed more light upon therapeutic functionalities of acupressure and to encourage its practice across the hospitals.

In the treatment of pain, Transcutaneous Electrical Nerve Stimulation (TENS) has the advantage that it is easy to administer - after instruction and a short trial period patients can apply TENS themselves - and apart from (reversible) skin irritation it has no serious side effects. TENS is a method of applying low-voltage electrical current through the skin using surface electrodes to achieve pain control [14]. The use of electricity for pain control was documented in classical medicine by the first century [15]. By the mid-1700s, electricity was employed to treat a variety of diseases and pain [16]. After the interest in electrical stimulation for pain control had dissipated in the early part of the nineteenth century, a new interest in stimulation emerged with the presentation of the gate control theory [17].

For clinical application, TENS was first presented as a screening tool for spinal cord stimulation. Soon it became apparent that stimulation of the skin was often sufficient to provide pain control. The first data on TENS were presented in 1973 at the founding meeting of The International Association for The Study of Pain [18]. Apart from pain relief, TENS has

also been found to give rise to less pain interference with work, home and social activities, increased activity level and pain management and decreased use of other therapies including pain medication [19]. However the effects of TENS in chronic pain still raise two important questions. Firstly, there are no long-term placebo controlled studies and the results of short-term controlled studies in the treatment of chronic pain are inconclusive [20-24], thus questioning the specific working mechanism of TENS. Secondly, the efficacy of TENS treatment is assumed to decrease in time by long-term application of TENS [13,16], thereby endangering the long term use of TENS in chronic pain. The objective of this study was to determine the effectiveness of acupressure and TENS along with hot pack in neck pain.

### Material and Methods

Total of 40 subjects were randomly assigned, 20 each to both Group A (Acupressure group) and Group B (TENS Group) from Mamji Hospital Karachi. The duration of the study was six months from January 2016 to June 2016. Patients having neck pain from six months were included in this study. In the questionnaire a screening question was added that excluded those patients who have neck pain less than 6 months, pregnancy, cervical spine injections (steroidal) in past 2 week, any Cardiovascular and Neurological disorders, history of previous cervical spine surgery and patients who are taking any analgesic medication. The informed consent was obtained from each subject and the Ethical Clearance was obtained from the Central Ethical committee of Isra University. Group A received acupressure with hot pack. Group B received TENS with hot pack. Study continued for 6 weeks and a total number of 18 treatment sessions were given to each patient with 3 sessions per week on alternate days. Patients followed up after completion of intervention.

Assessment of the patients was done at the beginning and at the end of treatment. The Assessment was taken through NRS on 1<sup>st</sup> day and on 18<sup>th</sup> day as the study was for 18 days. Assessment of all the participants was done as per the assessment form. The intensity of pain was measured by Numeric Rating Scale. Group A received the acupressure therapy with hot pack. Hot pack was applied in supine lying for ten minutes. After that patient sat comfortably, with close eyes and breathe when massaging the active points. with three sets of acupressure by the pulp of the thumb in a rotary fashion at 20–25 cycles per minute for 30 seconds on each point was administered at the GB 21, B10, LI 4, GV 16, SI 14, and SI 15 consecutively. Group B received the TENS with hot pack. Hot pack was applied in supine lying for ten minutes. TENS was applied in prone position, pulsed current with rectangular monophasic shape, pulse duration of 10-15 milliseconds with frequency of 40-70 Hz. The duration of treatment was 20 minutes. t-test (paired) was used for intra group comparison. The results were presented by using bar charts and tables.

### Results

The majority of participants for this study were males. The mean age of Group B (TENS Group) was 28.60 years with the standard deviation of 4.083. The mean of pain duration for this group was 2.30 years and the standard deviation was 1.129. 6.80 mean of pain intensity with standard deviation of 1.005 was found in TENS group, however, in the category of Neck Disability Index (NDI), the mean of 26.20 with the standard deviation of 3.503 was found in (Pre-Treatment). Post Treatment of TENS group two variables were found. The pain intensity showed mean of 5.00 with the standard deviation of 1.170. However, the Neck Disability Index showed the mean 19.50 and the standard deviation of 2.875. In Acupressure Group (Pre-Treatment), different variables were found the mean age of the participants in this group was 27.95 years with the standard deviation of 2.645. The mean of pain duration was 2.00 years with the standard deviation was 0.973.

Pain intensity showed mean of 6.95 with standard deviation of 0.945 was found in this group. However, in the category of Neck Disability Index (NDI), the mean of 26.40 and the standard deviation of 5.595 were found in Acupressure group (Pre-Treatment). In Post-Treatment of Acupressure group, pain intensity showed mean of 3.60 with the standard deviation of 1.046. However, the Neck Disability Index showed the mean 15.40 and the standard deviation of 2.257. In the comparison of Pre and Post-Treatment among the TENS Group, mean of Pain intensity in Pre-Treatment was 6.80 ± 1.005, while in Post-Treatment it was 5.00 ± 1.170 with the P-Value of 0.027. However, in Pre-Treatment, the Neck Disability Index was 26.20 ± 3.503 and in Post-Treatment, it was 19.50 ± 2.875 with the P-Value 0.002. The comparison of Pre-Treatment and Post-Treatment among the Acupressure Group, mean of Pain intensity in Pre-Treatment was 6.95 ± 0.945, while in Post-Treatment it was 3.60 ± 1.046 with the P-Value of 0.001. However, in Pre-Treatment, the Neck Disability Index was 26.40 ± 5.595 and in Post-Treatment, it was 15.40 ± 2.257 with the P-Value 0.001 (Tables 1 & 2), (Figures 1 & 2).

**Table 1:** TENS Group comparison.

Variable	Pain Intensity	Neck Disability Index
Pre-Treatment	6.80, ±1.005	26.20, ± 3.503
Post-Treatment	5.00, ±1.170	19.50, ± 2.875
P value	0.027	0.002

**Table 2:** Acupressure Group comparison.

Variable	Pain Intensity	Neck Disability Index
Pre-Treatment	6.95, ± 0.945	26.40, ± 5.595
Post-Treatment	3.60, ± 1.046	15.40, ± 2.257
P value	0.001	0.001

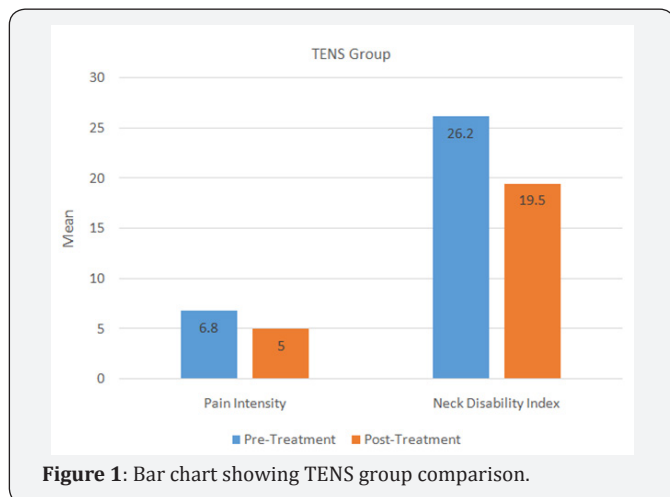


Figure 1: Bar chart showing TENS group comparison.

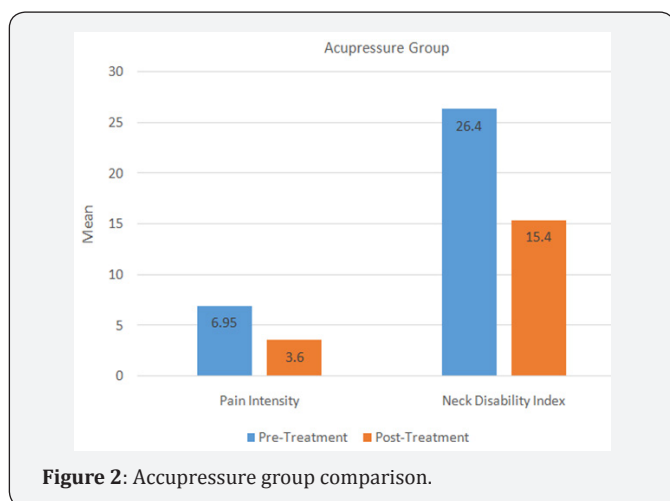


Figure 2: Acupressure group comparison.

### Discussion

Neck pain is one of the conditions which can be treated by a wide variety of Physical Therapy methods. Many studies examined the efficacy of acupressure for pain management. A majority of researcher (84%) concluded that acupressure was effective for pain management in adults. Most of these researchers reported that acupressure did not have adverse effects [25]. Hsieh LL study shows that acupressure is more efficacious in alleviating low back pain than is physical therapy, as measured by pain visual analogue scale, core outcome measures, Roland and Morris disability questionnaire, and Oswestry disability questionnaire [24]. The results of this study revealed that there is significant improvement in neck pain at the end of treatment sessions within both groups. Both the groups obtained successful outcome as measured by significant reduction of Numeric Rating Scale scores and Neck Disability Index. The results of this study support the randomized controlled clinical trial of Hsieh LL on low back pain treated by acupressure. Acupressure may thus be useful for reducing pain and improving body's function and decreases level of disability in neck pain.

In most of the studies, different outcome measures were used to distinguish the difference between the acupressure

group and the physical therapy group, irrespective of absolute change or mean change from baseline at post-treatment and six weeks follow-up assessments. The Roland and Morris disability questionnaire has been considered an outcome measure sensitive to changes in clinical status for the study of low back pain [12,13]. In this study, results showed statistically significant treatment differences with numeric rating scale and neck disability index. Results for the neck disability index score also showed functional improvement with acupressure.

Roscoe et al. study results revealed that those patients who treated by acupressure responded more positive effects than those who treated by other physical therapy techniques [24]. However, Rosenberg et al. concluded that most of the chronic pain patients treated with acupressure or alternative therapy in addition to their traditional treatment. The traditional treatment strategy was mostly preferred when given the option between traditional treatment and alternative therapy [13]. Although in our study, most of the patients preferred acupressure therapy as compare to traditional treatment. Results showed most effectiveness of acupressure in neck pain and increase the functional activities of daily living. The results of this study revealed that acupressure on neck pain significantly reduces the parameters of the pain-associated conditions and NDI whereas no significant differences in all parameters in the control group. Acupressure on the local acupuncture points significantly reduces pain intensity and NDI. Satisfaction due to acupressure continued until 1 day after treatment on the distal points as well as the local points.

### Conclusion

This study concluded that, individuals with neck pain who received acupressure demonstrated better overall short-term outcomes on Numeric Rating Scale compared to individuals receiving TENS treatment. This study provides the clinicians with further insight that manual techniques provide better effects as compared to electrical modalities in the specific treatment of individuals with chronic neck pain.

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