Compare the Effectiveness of Ultrasound Versus Trigger Point Release on Cervicogenic Headache

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Abstract

Background: Cervicogenic headache is a unilateral, fixed, or side-locked headache that commonly affects adults. The studies had tried therapeutic and hands-on therapy for managing the Cervicogenic headache. The intent of this current study is to identify whether ultrasound or trigger point is more effective for Cervicogenic headaches.

Purpose: To compare the effectiveness of ultrasound versus trigger point release on patients with cervicogenic headache.

Materials and Methods: This experimental study has been conducted from November 2022 to April 2023. 30 cervicogenic headache subjects were taken from Shanthi physio clinic selected based on the criteria of inclusion and exclusion. Numerical pain rating scale (NPRS) was used to measure pain and Neck disability index (NDI) was used to identify head and neck function of the participants. The subjects were divided into Group A (15 Subjects) and Group B (15 Subjects). Group A were treated with Trigger point release with trigger point localization and Group B were treated with Ultrasound with trigger point localization. The treatments were given for 5 days per week and continued for 4 weeks.

Result: The pretest and post test values were analyzed, results suggest that trigger point release with trigger point localization has significant improvement when compared with ultrasound with trigger point localization with p value <0.001.

Conclusion: It is suggested that trigger point release with trigger point localization can be more effective for reducing the pain.

Keywords: Ultrasound, trigger point release, pain, Cervicogenic headaches, NPRS, NDI.

Introduction

Cervicogenic headache is a unilateral fixed or side locked headache that has non throbbing pain that radiates to the ipsilateral side of the temporal region. An uncommon but still debatable type of headache caused by neck tissues is called a cervicogenic headache. Usually the estimated prevalence of this disorder is 0.7% to 13.8% which is rather wide³. Because it is thought that cervicogenic headache refers to pain brought on by irritation caused by cervical structures, any form that is caused by the cervical from 1 to 2 of the nerves of the body ²,³,⁴.
The physiological cause of this discomfort is the convergence of the top three cervical spinal neurons' afferents and trigeminal afferents. There are several factors that might contribute to this form of headache, including arteries and other factors. These factors are what make the person’s headache so severe. It is a rare form of headache that most commonly affects adult between the age range of 30 and 44 years. The symptoms include visual disruption, dizziness and difficulty in swallowing. The spine of the cervical and its associated element such as bones and soft tissues can become dysfunctional, leading to the syndrome known as the cervicogenic headache.

Stress on muscle fibres and the development trigger point may be caused by acute trauma or recurrent microtrauma. Patients may have localized ongoing pain that limits the range of motion in the afflicted muscle-these include the pelvic girdle, neck, shoulder and other muscles involved in maintaining good posture. Localized and referred pain are the key characteristics of muscle absorption. The role of sensitization mechanisms is supported by the neurophysiological underpinnings of myalgia. TrP has the potential to activate the trigeminal nucleus, which in turn will cause a migraine or cluster headache. People with this headache have responded well to appropriate treatment that targets trigger point deactivation, but the studies are required to fully understand the role.

In most cases, the pain of CEH starts in the brain and spreads everywhere and it can cause reduced activities of our body and increase by more movements of the persons. Ultrasound has been used widely because of its use in various fields in reducing pain. Ultrasound treatments can be categorized as having “high” or “low” energy. Low energy uses include ultrasound and bone mending. Ultrasound therapies are used outside of physical therapy.

**Aim**

To compare the effectiveness of ultrasound versus trigger point release on patients with cervicogenic headache.

**Material and Methods**

This study is an experimental study done for 30 subjects from the age range of 30 and 44 years. Convenient sampling technique is used in this study.

**Study procedure:** from November 2022 to April 2023.

**Materials required:** Chair, Ultrasound, acoustic gel, cotton, pillows.

**Inclusion criteria:**
- Both the gender
- Be in the 30-44 age range
- Participants having an NPRS score from 4 to 10
- Neck movement aggravated by pain.
- Limited cervical motion
- The muscle contains an active trigger point.

**Exclusion criteria:**
- Other headaches like migraine and TTH
- Two-sided headache
- Had treatment for the head and neck in the previous year
- Any ailments that could make manual therapy ineffective
- Patients with visual disruption and dizziness are excluded.

**Outcome measure:**

Assessment was done before the treatment and after 4 weeks of intervention
- Numerical pain rating scale (NPRS)
- Neck disability index (NDI).

**Procedure**

The 30 subjects were selected based on the criteria. The detailed procedures for performing the study were clearly explained to the subjects, and the informed consent form was collected from them before proceeding the study. The pre and posttest values are measured using the pain scale and NDI. The subjects were divided into 2 groups. Control group received ultrasound with trigger point localization alone and the experimental group received a trigger point release with trigger point localization. The trigger point release group is considered as a group A and ultrasound group is considered as a group B. Group A consists of sample size(n=15) and group B consists of sample size(n=15).
Group A (Trigger point release group)

This group received trigger point release with trigger point localization. The procedure was concentrated on the trapezius, SCM, cervical, and temporal muscle. The patient was positioned in a sitting position and then the treatment was given. The Palpation can be done using the thumb and index finger, and the participant will be responding verbally by saying local and referred pain they felt. The “n “ was marked on the collection sheet of the data if the muscle does not have a trigger point. The Trigger point was located, then the hand was positioned and compression was given perpendicular to the target Muscle. The trigger point was released until the tissue felt lightened or softened. The subjects described a decrease in symptoms as the point releases. 90 seconds holding produces the best drastic change and result but 30 seconds is enough to produce a change.

Group B (Ultrasound group)

This group received Ultrasound with trigger point localization. The modality was performed with the informed consent by the patient. The electrodes with the gel were placed on the region on the trapezius, levator scapulae, scalene and suboccipital extensor based on pain. During this procedure the patients were positioned in a sitting position. The whole procedure typically lasted for 20 minutes and the ultrasound was given for 5-8 minutes. After the procedure the machine was turned off. The protocol was clearly informed to the patient that they should not undergo any other electrotherapy while participating in this treatment.

Parameters:

- Frequency – 1MHz
- Duration – 5 to 8 minutes
- Intensity – 1.5W/cm2
- Mode – pulsed mode

Data analysis

Using descriptive and inferential statistics, the acquired data was tabulated and evaluated.
Results

An analysis made with the data collected revealed a difference between the trigger point release group and ultrasound group and was also evaluated within the groups. The paired and unpaired t-test were used to statistically analyze the values. A significant difference was found between the trigger point release group and ultrasound group as well as within the group, according to the statistical analysis performed on the quantitative data. In the trigger point release group the post-test mean and standard deviation values for NPRS and NDI are 1.80 ± 0.68 and 29.00 ± 9.17 while in the ultrasound group the values are 3.53 ± 0.64 and 42.13 ± 7.36. This demonstrates that the experimental group’s final result shows a reduction in pain.

Discussion

The current study is to compare the effectiveness of trigger point release with trigger point localization and ultrasound with Trigger point localization to reduce headache and pain and also to assess the effectiveness in terms of reducing pain and disability.

The comparison is demonstrated with a duration of 4 weeks. The results were measured by the pain scale and NDI questionnaire before and after the treatment. Beneficial effect in Group A (Trigger point release with trigger point localization) is more than in Group B (ultrasound with trigger point localization). When the responses were compared between both groups, the result showed a significant difference in trigger point release with trigger point localization than the Ultrasound with trigger point localization group.

In Group A (Trigger point release with trigger point localization) pre-intervention mean of NPRS in group A was 5.60± and 1.80 ± After the treatment, the mean value of NPRS is reduced to 1.80± and 0.68± and in NDI the pre _value is 55.47 ± and 8.85± and in post value it is 29.00 and 9.7 which shows significant difference between the groups. In Group B (Ultrasound with trigger point localization ) pre-intervention mean of NPRS 5.53± and 1.46± .After treating the subject with ultrasound with trigger point localization , the mean of NPRS is reduced to 3.53± and 0.64± ,then with NDI the pre_value is 55.13± and 3.20± and in post value it is 42.13± and 7.3± which shows difference between the groups.

Based on the results, both groups showed improvement. However, subjects in Group A who received Trigger point release with trigger point localization showed better improvement in NPRS and NDI than the subjects in Group B who received Ultrasound with trigger point localization. An early study by R Michael Gallagher et al.2007 concluded that the headache arises from the neck that is the major reason for this, but the reason for the headache in the neck is pivotal11.

An early study by Gema Bodes-Pardo et al. in 2013 concluded that hands-on therapy plays a major role in reducing the trigger points on the head and neck when compared to other therapy14. An early study by Natalija Stefanovitch-Lawbuary et al. 2019 concluded that the NDI accurate and timely indicators of improvement following physiotherapy for neck pain caused by neck injury15. An early study by Zhaokui Jin et al.2017 concluded that scanning of Ultrasound can help in identifying trigger causes and that could be a useful tool for this diagnose16. The early study by Matthew Fernandez et al.at 2020 had compared this condition with spinal manipulation exercises and the current study involves ultrasound with trigger point localization and trigger point release with trigger point localization17. So, the current study shows that
trigger point release with trigger point localization seems to be more effective for improving head and neck functions. The results obtained from this study has identified that trigger point release with trigger point localization has proved to be effective and this hands on therapy can be incorporated in the recovery for the patients of cervicogenic headache.

**Conclusion**

The study concludes that the trigger point release along with trigger point localization and ultrasound with trigger point localization is effective for patients with cervicogenic headache but trigger point release with trigger point localization seems to be more effective than ultrasound with trigger point localization.

**Ethical clearance:** The ISRB committee of a private hospital and institution in Chennai has provided its clearance for the conduct of human research that complies with all applicable national laws, institutional regulations. (Application Number 03/032/2022/ISRB/SR/SCPT).

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**Conflict of interest:** The authors state that there is no conflict of interest.

**References**