Comparison of Low Level Laser Therapy with Cryostretch and Ultrasound Therapy with Cryostretch among Individuals with Upper Trapizitis

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Abstract

Background: One of two important superficial muscles, the trapezius extends laterally to the scapular spine and longitudinally from the occipital bone to the lower thoracic vertebrae. Scapulae movement and arm support are two of its roles.

Purpose: To determine and compare the effect of low level laser therapy with cryostretch and ultrasound therapy with cryostretch in upper trapizitis patient.

Materials and Methods: A total of 322 subjects were selected randomly based on inclusion and exclusion criteria. Written informed consent obtained from the participants who met a pre-defined inclusion and exclusion criteria. History of pain was collected from the patient. In this study, the samples were randomly divided into two groups and group A had a low level laser therapy with cryostretch and group B had a ultrasound therapy with cryostretch. Treatment was administered for weeks three times a week.

Results: The statistical analysis of the data using paired and unpaired t-tests revealed a substantial improvement in the participants who received cryostretch ultrasound therapy.

Conclusion: The study concluded that ultrasound therapy with cryostretch was more effective in reducing the pain when compared to low level laser therapy with cryostretch in patient with upper trapizitis.

Key Word: Ultrasound, Low Level Laser therapy, Upper trapizitis, Numerical Pain Rating Scale (NPRS), Neck Disability Index (NDI).

Introduction

One of two important superficial muscles, the trapezius extends laterally to the scapular spine and longitudinally from the occipital bone to the lower thoracic vertebrae. Scapulae movement and arm support are two of its roles. The descending, ascending, and intermediate trapezius regions are all functioning. By attaching to the clavicle and scapula and controlling the cervical spine through muscle, the muscle contribute to the rhythm of the scapulo-humeral joint.

Symptoms include a headache with tension in the temples, eye pain, a stiff neck, limited range of motion, and a sensitivity to weight on the shoulder.

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For both working men and women, neck pain has been the most prevalent primary complaint. Treatment for trigger points in the trapezius involves myofascial release. It works by releasing the tension in the tightened muscle and enhances lymph drainage and circulation. It affects connective tissue viscoelastic characteristics. It corrects the alignment of the muscles. Ice has been utilized as a form of treatment for a very long time.

The most often utilized substance for musculoskeletal injury testing is ice. Vasoconstriction, decreased tissue metabolism, reduced oxygen uptake, inflammation, and muscular spasm are among side effects of cryotherapy. After releasing a trigger point, stretching the muscle prolongs pain alleviation.

Numerous approaches can be used to treat myofascial pain, including manual therapy, acupuncture, stress management, electrotherapy, body mechanics and ergonomic training, dietary counselling, and various pharmaceutical management techniques.

Upper trapezius muscle involvement is mostly indicated by neck pain that is frequently felt in the back of the neck and between the bases of the neck and shoulder. At some point in their life, around two-thirds of people will have neck pain. Upper trapezius spasm patients have received medical and physical therapy care for a sizable portion of their cases.

Aim

To find the comparison between low level laser therapy with cryostretch and ultrasound therapy with cryostretch in patient with upper trapezitis.

Material and Method

A total of 322 subjects were selected randomly based on inclusion and exclusion criteria. Written informed consent obtained from the participants who met a pre-defined inclusion and exclusion criteria. History of pain was collected from the patient. In this study, the samples were randomly divided into two groups and group A had a low level laser therapy with cryostretch and group B had a ultrasound therapy with cryostretch.Treatment was administered for weeks three times a week.

Inclusion criteria:
- Upper trapezius pain
- Gender: male and female
- Age group: 25 to 45 years of age
- Myofascial Trigger Point in upper trapezius

Exclusion criteria:
- Myofascial Trigger Point injection in prior 6 month
- Shoulder surgery
- Fibromyalgia
- Cervical radiculopathy

Outcome measures:

Assessment was performed at baseline (before starting of treatment) and after four weeks of study.
- Numeric Pain Rating Scale [NPRS]
- Neck Disability Index [NDI]

Procedure

A total of 322 subjects were selected randomly based on inclusion and exclusion criteria. Written informed consent obtained from the participants who met a pre-defined inclusion and exclusion criteria. History of pain was collected from the patient. In this study, the samples were randomly divided into two groups and group A had a low level laser therapy with cryostretch and group B had a ultrasound therapy with cryostretch.

Group A: Low Level Laser Therapy with Cryostretch Group

The patient was positioned (sitting) and carefully inspected. The power duration and dose were both set to zero before turning on. Furthermore, the patients were instructed to report any discomfort or extreme heat. A single wavelength of light is produced by low level laser therapy, which is a non-invasive light source treatment. It produces no heat, noise, or vibration. Depending on the patient’s sensitivity, low-level laser therapy between 600 and 1070 nm was administered for ten minutes and cryotherapy for 2 mins. Treatment was administered for weeks three times a week.
Group B: Ultrasound Therapy with Cryostretch Group

The patient was positioned (sitting) and carefully inspected. The power duration and dose were both set to zero before turning on. Furthermore, the patients were instructed to report any discomfort or extreme heat ultrasound therapy of 3MHZ (approx. 1.5 intensity) was administered for ten minutes and cryotherapy for 2 mins. Treatment was administered for weeks three times a week.

Both group were treated with following exercises with 10 repetitions and 2 sets

- Ear to Shoulder Stretch
- Crocodile Stretch
- Cobra Stretch
- Cat and Camel Stretch
- Self hug Stretch

Ear to Shoulder Stretch
Position: Sitting

The subjects were instructed to cross their legs on the floor and stretch their spine. Subjects were told to keep their hands clasped behind their back, move them toward their right hip. As they exhale then tuck their right ear gently towards their right shoulder.

Crocodile Stretch
Position: Prone lying

The subject were instructed to tuck their hands beneath their head as they lay on their stomach on the floor. They were told to relax their head over the right hand and close their eyes, ask to place their right palm on top of the left palm on the ground. Ask the subjects to extended their leg as much as feasible.

Cobra Stretch
Position: Prone lying

The subjects were instructed to lie down on the mat, straighten their legs, and place their hands on the ground, palms facing down. They were told to slowly elevate their upper backs while pressing their hips into the mat and keeping their head and neck in a neutral position.

Cat and Camel Stretch
Position: Squat

The subjects were instructed to squat on the ground. They were told to slowly elevate their upper backs while pressing their hips into the ground and turn their back up toward the ceiling and stretch for 15 to 30 sec.

Self Hug Stretch
Position: Standing

The subjects were instructed to stand straight and hold their arms out to the sides of their body at shoulder height. They were told to straighten their arms and hold their upper torso in both of their arms.

Data Analysis

Graph 1: Comparison of Numerical Pain Rating Scale and Neck Disability Index Between Pre-test and Post-test values within the Low level laser therapy with cryostretch group

Graph 2: Comparison of Numerical Pain Rating Scale and Neck Disability Index Between Pre-test and Post-test values within Ultrasound therapy with cryostretch group
Graph 3: Comparison of Numerical Pain Rating Scale and Neck Disability Index Between Post-test values within the low level laser therapy with cryostretch group and Ultrasound therapy with cryostretch group

**Result**

The NPRS Post test mean value in the low level laser therapy group was 4.86, while it was 2.25 in the ultrasound therapy group. This indicates that the low level laser therapy group NPRS scores were significantly higher than the ultrasound therapy group with the P-value of <0.0001.

The NDI Post test mean value in the low level laser therapy group was 22.45 whereas the ultrasound therapy group was 10.44. This indicate that the low level laser therapy group NDI score were significantly higher than the ultrasound therapy group with the P-value of <0.0001.

Statistically analysis of the NPRS And NDI post test result revealed that the Low level laser therapy group and ultrasound therapy group showed similar statistically significant differences. As a result, the ultrasound therapy group exceeds the low level laser therapy group statistically.

**Discussion**

The goal of the present study is to compare the effectiveness of low level laser therapy with cryostretch and ultrasound therapy with cryostretch in management on upper trapezitis and also to assess the effectiveness in terms of reducing pain and improving neck function. This comparison is demonstrated with duration of 4 weeks. The outcome result were measured by NPRS and NDI scale before and after treatment. Beneficial effect were significantly greater in Ultrasound therapy with cryostretch than the low level laser therapy with cryostretch. When the response was compared between both groups, the result showed a significant difference in ultrasound therapy with cryostretch group than low level laser therapy with cryostretch group.

In Low level laser therapy with cryostretch group pre-intervention mean of NPRS was 7.52 and NDI was 40.44. After treating the subject with low level laser therapy with cryostretch, the mean value of NPRS and NDI is decreased to 4.86 and 22.45, which shows statistically significant difference between the groups.

In Ultrasound therapy with cryostretch group pre-intervention mean of NPRS was 7.52 and NDI was 40.44. After treating the subject with Ultrasound therapy with cryostretch, the mean value of NPRS and NDI is decreased to 2.25 and 10.44, which shows statistically significant difference between the groups.

Based on the statistical analysis, both group showed improvement in NPRS and NDI. However, the subject in Ultrasound therapy with cryostretch group who received Ultrasound therapy with cryostretch showed better improvement in NPRS and NDI than the subjects in the low level laser therapy with cryostretch group who received low level laser therapy with cryostretch.

An early study by M. Priyanka and T. G. Tilak Francis et.al.(2017) revealed that dry needling therapy is more successful than cryotherapy in treating the trigger point of the upper trapezius muscle in terms of decreased pain intensity and increased range of motion17.

An early study by Mayuriparab, Njlima bedekar et. al.(2020) revealed that Myofascial release and cryostretch were both shown to be beneficial in lowering pain. When compared to cryostretch, the myofascial release immediately improved cervical lateral flexion range of motion more18.
An early study by Priyakannan et al. (2012) study that laser therapy can be a useful treatment plan for treating myofascial trigger points and minimising the disability brought on by musculoskeletal dysfunction.

An early study by MA Yildirim, O Kadriye et al. (2018) study that due to its non-invasive nature, lack of discomfort, and ease of usage, ultrasound therapy can be utilized to treat trigger points in patients who choose not to have injectable therapy.

An early study by Ebrullbulbu, Aysegul Cakmak et al. (2004) study that Because of its noninvasiveness, simplicity, and short-term administration, laser therapy may be helpful as a therapeutic option for myofascial pain syndrome.

An early study by Walaa Abu Taleb, Aliaa Rehan Youssef et al. (2016) revealed that pressure release utilizing an algometer on the upper trapezius myofascial trigger points quickly increased passive contralateral side-bending ranges when compared to placebo and myofascial pressure release, but active range only improved when compared to placebo.

An early study by Haytham M El-Hafez, Hend A Hamdy et al. (2020) revealed that subjects with upper trapezius trigger points can benefit from instrument assisted soft tissue mobilization and stripping massage treatments to reduce their pain and improve their function.

Conclusion

This study concludes that both the techniques used in the current study that is low level laser therapy with cryostretch and ultrasound therapy with cryostretch, are helpful for lowering pain increasing range of motion and reducing disability. However, ultrasound therapy with cryostretch is superior than low level laser therapy with cryostretch in individuals with upper trapizitis.

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Conflict of Interest: Nil

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