Original Article

To Compare the Effect of Ischemic Compression versus Dynamic Stretching Exercises on Pain in Subjects with Upper Trapezitis

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Abstract

Background: The most prevalent musculoskeletal ailment is trapezitis, which primarily affects the upper trapezius muscle due to overuse or strain.

Purpose: The purpose of this study is to find out the effect of ischemic compression and dynamic stretching exercises on pain in subjects with upper trapezitis.

Materials and Methods: A total of 40 subjects were chosen from Neha Clinic and assigned to two groups, namely the ischemic compression group along with Transcutaneous Electrical Nerve Stimulation (TENS) (n=20) and the dynamic stretching exercises group along with TENS (n=20), based on inclusion and exclusion criteria. Visual analog scale (VAS) and cervical range of motion (CROM) were used as outcome measures. The entire process was performed from November 2022 to April 2023.

Result: The mean value of ischemic compression at the post-test was found to be higher than the mean value of dynamic stretching exercises, with a p-value of less than 0.0001

Conclusion: The findings of this study suggest that ischemic compression is more effective than dynamic stretching exercises in reducing pain associated with upper trapezitis.

Keywords: Transcutaneous Electrical Nerve Stimulation (TENS), upper trapezitis, Visual Analog Scale (VAS), Cervical Range of Motion (CROM).

Introduction

The trapezius muscle is a large back muscle that resembles a trapezoid in shape.[1] It extends laterally from the spine of the scapula and descends from the outward protrusion of the occipital bone to the lower thoracic vertebrae. As one of the postural muscles, the trapezius is susceptible to overloading.[2] Upper trapezitis commonly arises from overuse or strain of the trapezius muscle.

Ischemic compression is a technique that applies continuous digital pressure to trigger points using an acceptable force. When the ischemic pressure is released after 8 to 20 seconds, the local area experiences improved blood circulation, increased oxygen supply, and enhanced nutrient delivery.[3]

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Dynamic stretching exercises can improve flexibility, range of motion, muscle tightness, and blood flow. It can positively influence force and power when performed for longer durations, potentially enhancing performance.

Aim

To find out the effect of ischemic compression and dynamic stretching exercises on pain in subjects with upper trapezitis.

Material and Method

It was a comparative study which included 40 subjects with upper trapezitis, age between 18-30 years. Convenient sampling with random allocation method was done in this study. The entire process was performed from November 2022 to April 2023.

Inclusion criteria:

- Individuals diagnosed with upper trapezitis.
- Age range between 18 and 30 years.
- Presence of palpable trigger points in the upper trapezius muscle.
- Positive jump sign during clinical examination. Age

Exclusion criteria:

- History of intervertebral disc prolapse.
- Previous cervical spine fractures.
- Diagnosis of cervical radiculopathy.
- Severe pain with a score above 8 on the VAS.

Outcome measures:

Assessment was done before and after the end of 8 weeks of study.

- Visual analog scale (VAS) to assess the pain.

It involves a straight line with end points representing different levels of a subjective experience, such as pain, anxiety, or overall well-being.

- Cervical range of motion (CROM) to assess the lateral flexion. It used to assess the movement and flexibility of the cervical spine.

Procedure

A sample size of 40 participants was included in this study based on a randomization method. Prior to their involvement, subjects provided written consent by signing a consent form. The participants in the ischemic compression group received ischemic compression for pain relief, consisting of 9 sets performed three days per week over a two-week period. Additionally, they received Transcutaneous Electrical Nerve Stimulation (TENS) for 10 minutes in each session, with a total of four sessions per week.

On the other hand, the participants in the dynamic stretching group engaged in dynamic stretching exercises, which involved performing two sets of 15 repetitions for five different stretches. These exercises were conducted over a two-week duration. Similar to the ischemic compression group, they also received TENS for 15-30 minutes during each session, with a total of four sessions per week.

These protocols were implemented to assess the effects of ischemic compression and dynamic stretching exercises, combined with TENS, on pain reduction in individuals with upper trapezitis.

Group A: Ischemic compression:

Positioning: Participants were comfortably seated. Pressure: Direct pressure was applied to the trigger point using fingers. Pressure was initially moderate and gradually increased to a tolerable level. Duration: Each compression session lasted from 30 seconds to 2 minutes. Sensation: Participants reported experiencing a satisfactory sensation during the compression. Adequate rest periods were provided between successive treatments.

Group B: Dynamic stretching exercises:

Side flexion stretch:

Starting position: Participants were seated with their feet shoulder-width apart and arms in a relaxed position. Targeted side: The desired site on the upper trapezius was identified. Execution: Participants tilted their head to the opposite side of the targeted upper trapezius muscle, elongating the neck while avoiding lowering the shoulder. A gentle stretch was applied along the side of the targeted upper trapezius. Duration: The stretch was held for 15-30 seconds. Return to starting position: Participants brought their head back to an upright position and lowered their arm back down to their side. Frequency and repetitions: The stretch was repeated 2-3 times on each side.

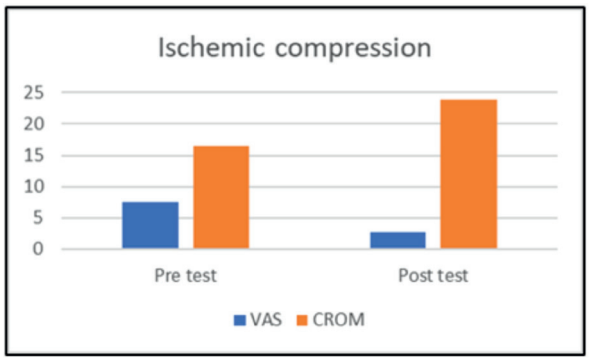
Lateral flexion stretch:

Starting position: Participants were seated with their feet shoulder-width apart and arms in a relaxed

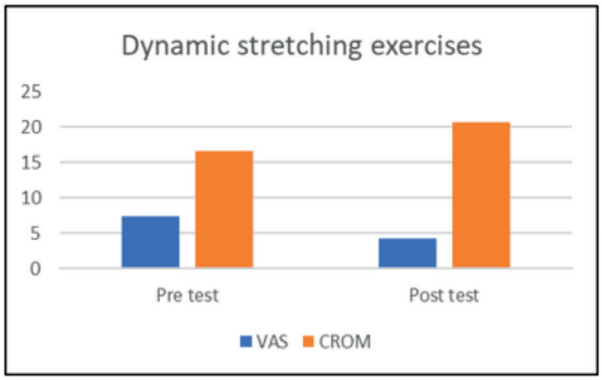
position. Stretching movement: Participants tilted their head to the side, bringing their ear closer to the shoulder. A gentle stretch was applied along the side of the neck and upper trapezius, beginning with the affected side. Hand placement: The hand was placed on the opposite side of the head, applying slight downward pressure. Duration: The stretch was held for 15-30 seconds. Return to starting position: Participants brought their head back to an upright position and lowered their arm back down to their side. Frequency and repetitions: The stretch was repeated 2-3 times on each side. Return to starting position: Head is brought back to an upright position. Arm is lowered back down to the side.

Data analysis

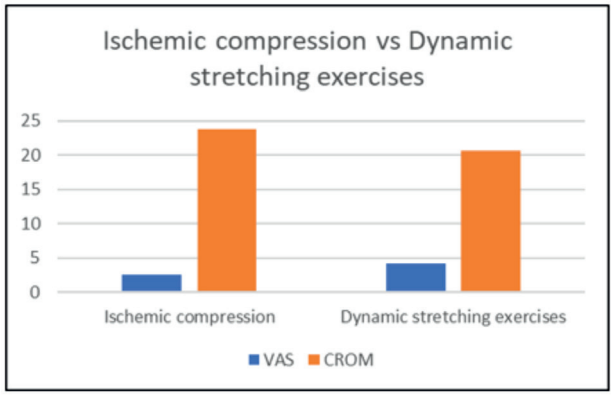
Using descriptive and inferential statistics, the data collected were tabulated and analyzed. The mean and standard deviation (SD) were applied to all parameters. The significant differences between the ischemic compression group and the dynamic stretching exercises group were analysed using an unpaired t-test. A p-value of <0.0001 was known to be statistically significant.



Graph - 1 shows that the values are extremely statistically significant



Graph - 2 shows that the values are extremely statistically significant



Graph - 3 shows that the values are extremely statistically significant.

Result

The study examined the effects of ischemic compression and dynamic stretching exercises on pain (assessed by VAS) and range of motion (assessed by CROM) in individuals with upper trapezitis. The pre-test and post-test values of VAS and CROM were analysed for Group A (Ischemic Compression) and Group B (Dynamic Stretching Exercises).

The mean VAS score significantly decreased from 7.45 to 2.65 in Group A and from 7.45 to 4.25 in Group B, indicating a reduction in pain intensity. Similarly, the mean CROM significantly increased from 16.5 to 23.8 in Group A and from 16.5 to 20.6 in Group B, indicating an improvement in range of motion.

Graph 1 visually represents the comparison of pre-test and post-test values of VAS for Group A and Group B, demonstrating a substantial reduction in pain intensity after the interventions.

The mean VAS score was significantly lower in Group A (2.65) compared to Group B (4.25), indicating a greater reduction in pain intensity in Group A.

Graph 2 illustrates the comparison of post-test values of CROM for Group A and Group B. Group A exhibited a higher mean CROM (23.8) compared to Group B (20.6), suggesting a greater improvement in range of motion in Group A.

The mean CROM was significantly higher in Group A (23.8) compared to Group B (20.6), indicating a more pronounced improvement in range of motion in Group A.

Graph 3 represents the comparison of post-test values of VAS for Group A and Group B, indicating a greater reduction in pain intensity in group A.

In conclusion, both ischemic compression and dynamic stretching exercises resulted in significant improvements in pain reduction and range of motion in individuals with upper trapezitis. However, Group A (Ischemic Compression) showed superior outcomes in terms of pain reduction (VAS) and range of motion (CROM) compared to Group B (Dynamic Stretching Exercises). These findings suggest that ischemic compression may be more effective in alleviating pain and improving functional outcomes for individuals with upper trapezitis.

Discussion

The objective of this study was to compare the efficacy of ischemic compression and dynamic stretching exercises in reducing pain and improving range of motion in individuals with upper trapezitis. The results demonstrated that both interventions led to significant improvements in pain reduction and range of motion, but ischemic compression showed superior outcomes compared to dynamic stretching exercises.

The findings of this study are consistent with previous research. Pathan et al. (2021) reported that ischemic compression effectively reduced pain and improved discomfort and referral patterns in patients with upper trapezitis.[4] Similarly, Ahmad et al. (2022) found that both spray stretches and sustained pressure techniques were effective in increasing pain tolerance and range of motion in individuals with trigger points in the upper trapezius muscle.[5] These studies support the use of ischemic compression as a viable treatment option for pain management in upper trapezitis.

Dynamic stretching exercises have also been shown to have positive effects on pain reduction and range of motion. Iwata et al. (2019) demonstrated that dynamic stretching resulted in increased range of motion and reduced passive stiffness in the hamstring muscles.[6] Jhaveri et al. (2018) compared myofascial release and muscle energy technique in the management of trapezitis and found that both interventions were effective in improving pain, disability, and range of motion.[7] These findings suggest that dynamic stretching exercises can be beneficial for improving flexibility and reducing stiffness in various musculoskeletal conditions.

In this study, the mean value of pain reduction (measured by VAS) in the ischemic compression group was significantly higher than that in the dynamic stretching exercises group. This suggests that ischemic compression may be more effective in reducing pain associated with upper trapezitis.[8] Ischemic compression is known to release trigger points, improve blood circulation, and promote tissue healing and recovery. The release of trigger points can help alleviate muscular tightness and reduce pain. Additionally, the temporary increase in blood flow after releasing the compression brings fresh oxygen and nutrients to the affected area, further aiding in pain relief and healing.

The mean value of range of motion (measured by CROM) in the ischemic compression group was also significantly higher than that in the dynamic stretching exercises group.[9,10] Ischemic compression has been shown to improve joint range of motion and muscle function. By releasing trigger points and stimulating mechanoreceptors, ischemic compression helps restore normal muscle function and improve joint mobility. This may explain the greater improvement in range of motion observed in the ischemic compression group.

While both interventions showed significant improvements, it is important to consider individual preferences and contraindications when selecting the appropriate treatment for upper trapezitis. Ischemic compression may not be suitable for individuals with specific medical conditions or over areas of acute inflammation, open wounds, infected tissues, or compromised blood circulation. Dynamic stretching exercises, on the other hand, may be more accessible and suitable for a wider range of individuals.[11,12] Additionally, combining these interventions with other modalities such as Transcutaneous Electrical Nerve Stimulation (TENS) can further enhance their effectiveness in pain management and functional improvement.[13,14,15]

It is worth noting that the current study has some limitations. The sample size was relatively small, and

the study duration was limited to two weeks. Future studies with larger sample sizes and longer follow-up periods could provide more robust evidence of the efficacy and long-term effects of these interventions. Additionally, assessing other outcome measures such as quality of life, functional disability, and patient satisfaction could provide a more comprehensive evaluation of the interventions' effectiveness.

In conclusion, this study suggests that both ischemic compression and dynamic stretching exercises are effective in reducing pain and improving range of motion in individuals with upper trapezitis. However, ischemic compression showed superior outcomes compared to dynamic stretching exercises. Healthcare professionals can consider incorporating ischemic compression as a valuable treatment option for pain management and functional improvement in individuals with upper trapezitis. Further research is warranted to explore the long-term effects and optimal treatment protocols for these interventions.

Conclusion

In conclusion, this study provides empirical evidence supporting the efficacy of ischemic compression as a viable management strategy for individuals with upper trapezitis. The findings indicate significant improvements in pain levels and range of motion following the intervention. Ischemic compression demonstrates positive effects on flexibility, muscle tightness, range of motion, in the management of upper trapezitis.

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