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Research article

Comparing the effectiveness of ischemic compression and taping techniques in reducing levator scapulae trigger point-related cervical pain

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ABSTRACT

Cervical pain is the common problem in all over the countries. It occurs any age group Individuals due to many causes like trauma, poor posture, pathological and ergogenic problems. To find out the effectiveness of taping and ischemic compression technique to reduce pain in levator scapulae trigger point related cervical pain. This study is an experimental with pre test and post test evaluation. 20 subject aged 22-45 years cervical pain patients are selected, the client were treated by ischemic compression and taping techniques. The outcome was measured using visual analogue scale, and active Range of cervical spine rotation measure by goniometer. Statistical analysis done by using paired 't' test showed that that there was significant improvement in subject who underwent the treatment of taping and ischemic compression technique. Hence, it is concluded that the taping and ischemic compression. Technique to reduce pain in levatorscalpulae trigger point related cervical pain.

Keywords: Cervical pain, Multimodal sensory stimulation program (MSSP), Median nerve stimulation (MNS), Glasgow coma scale (GCS), Coma recovery scale (CRS).

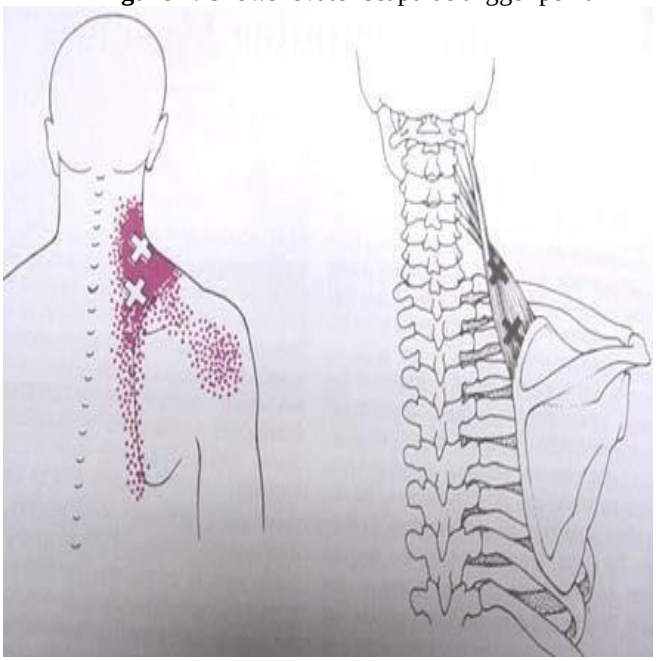
INTRODUCTION

Cervical pain is the common problem in all over the countries. It occurs any age group Individuals due to many causes like trauma, poor posture, pathological and ergogenic problems. Levator scapulae muscles trigger points also produce cervical pain and shoulder pain.Levator scapulae located on each side of the neck situated posteriorly. It named for its action in" Elevating" or "lifting" the scapulae. In Greek word , Levator means "To lift". Levatorscapulae muscle arise from posterior tubercle of transverse process of first four cervical vertebrae. It is inserted into the medial border of superior angle of scapulae. Levator scapulae muscle is blood supplied by dorsal scapular artery and nerve supply is third, fourth cervical nerve and Dorsal scapular nerve(C5). Levator muscles act along with trapezius to shrug the shoulder by its raising of the Scapula. If the scapula fixed the muscle assist in cervical extension and used alone flex the neck Laterally to one side. Levator scapulae trigger point are frequently produce stiff neck because of markedly limited neck movements. Myofascial trigger point in levator scapulae muscle can be activated and perpetuated by Occupational activities such as typing, with the head and neck turned to look towards one side of the type writer, making long telephone calls ,and taking length with head turned toward someone sitting by one side. Vigorous exercise that involved head turning such as playing tennis or swimming when out of shape; The repetitive rotation of the head as in "spectator neck" using a cane or crutches that are too long, Improper positioning, Flattend arch foot, Nutritional in adequacies such as Folic acid, Vitamin B2, B6, B12,Vitamin C deficiency, Metabolic, Endocrine inadequacies. Psychological factors

such as depression, good sport syndrome, chronic infections. Others factor such as impaired sleep, Radiculopathy, prolonged immobility also produce or activate Trigger points.

Trigger points are "A highly irritable localized spot of exquisite tenderness in nodule in a taut band of skeletal muscle" (Travell,simon 1999) [1].

Figure 1: Shows levator scapulae trigger point



Trigger points develop in the myofascia, mainly in the center of the muscle belly where the motor end plate enters. However, secondary or satellite trigger point after develop in a response to a primary trigger point. These satellite trigger point tend to develop along the line of the stress. These line of stress may be built in at the time of embryogenesis. The trigger point causes muscle to be sore, stiff, weak, and less flexible, and may trigger sensory, motor and autonomic phenomena.

The Trigger points are classified as central or primary Trigger point, satellite or secondary Trigger point, Attachment Trigger point, Diffuse Trigger point, Inactive or latent Trigger point, Active Trigger point. The theories of Trigger point:

Motor end plate theory

Energy crisis theory

Radiculopathic theory

Polymodel theory (PMRS)

Levator scapulae is a postural muscle. Levator scapulae develops trigger point tenderness in two locations. Central trigger points are at the where the muscle emerges from beneath the anterior border of the upper trapezius and much more readily identified secondary area where the muscle attaches to the superior angle of scapula. So the poor posture is a powerful "activator and perpetuator" of Trigger points. The involved muscle may be stiff and weak and may be restricted in range of motion.

The Pain from trigger point activities in this muscle is mainly felt at the base of the neck, but it also extended upwards towards the occiput; outward to the back of the shoulder and downwards along the inner border of the scapula.

The pain may also radiate interiorly around the chest wall along the course of the fourth and fifth intercostal nerve when it may erroneously be diagnosed as being either anginal or pleural or even more frequently as being due to intercostal nerve entrapment.

Trigger point examination by palpation of the muscle as it emerges from beneath the trapezius at the angle of neck dislodges it most important central trigger point that above the superior angle of the scapula often locates a second region of marked tenderness.

During examination, it is only possible to palpate taught band that lie close to the surface in superficially placed muscles. And if a palpable band is snapped by drawing examining finger sharply across it at a trigger point site in a manner similar to that employed when plucking a violin strings it is possible to evoke a transient contraction of the muscle fibers. This local twitch response (LTR) may be either visible or felt under the examine finger. And in same cases it is both seen and felt.

Levator scapulae Trigger points are differentially diagnosed with the condition like scapulo costal syndrome, zygophyseal pain and bursitis.

Levator scapulae trigger point related cervical pain is treated conservatively using Non-steroidal anti-inflammatory drugs, analgesics, Muscle relaxants, Non manual methods like saline injection and Dry needling and manual methods like Myofascial massage, Ischemic compression technique or Manual inhibition technique, Taping, muscle stripping, deep friction massage, vibration, TENS, IFT, Vapocoolant spray Stretching, Positional release technique, Muscle energy technique, and Strengthening exercises.

Ischemic compression, technique help to reduce the Trigger points. Trigger points can be deactivated by temporarily occluding their blood supply and causing a

reactive hyperemia (Increase blood supply): effectively flusing out the muscle of inflammatory exudates and pain metabolites, breaking down scar tissue, and reducing muscle tone. The muscle is nourished by the extra – flow through of blood, nerve ending are desensitized and scar tissue is broken down so that the muscle fiber can move better.

In this technique pressure is progressively over the trigger point area or Nodule or taut band in the muscle. The pressure is maintained until the tension is released. The pressure is applied by the therapist thumb, finger pad, knuckles and elbow. The pressure is applied 60 seconds maximum but mostly the desired effect is achieved in 10 – 20 sec. repeated for 3or 4 times. Perhaps, moving to another part of the muscle, if the treated area felt looser or softer to touch. Stretching, and active exercises are beneficial after the ischemic compression of the technique.

Taping will encourage correct the posture of the upper back and neck. It is currently used by therapist to change muscle tone, more Lymphatic fluids, Correct the posture, Tape can also be used facilitate weakened or lengthened muscles. It can be positioned along the direction of the muscle fiber and pulled together or shorten the tissue. Tape enhance our proprioceptive awareness of the muscles and increase muscle firing. It also used adjunct to the physiotherapy treatment.

Need for the Study

Levator scapulae trigger point related cervical pain occurs mainly in poor posture and overuse injuries of the muscles. Central trigger point in the levator scapulae at the angle of neck is palpated. The lower trigger point tenderness by electrical stimulates which produce pain refer to the neck and back of the shoulder and inter scapular region.

Many treatment have been a recommended various degree of success. But still there is a need to find out the effective conservative treatment for levator scapulae trigger point cervical pain.

So the need for the study is to find out the effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related cervical pain.

Objective of the Study

To find out the effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related cervical pain

Statement of the Problem

The effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related cervical pain

Operational Definitions

Trigger Point

A trigger point is a hyper irritable spot associated with a taut band of a skeletal muscle that is painful on compression or skeletal, and that can give rise to a typical reffered pain pattern as well as autonomic phenomenon (Simon et. al. 1999)

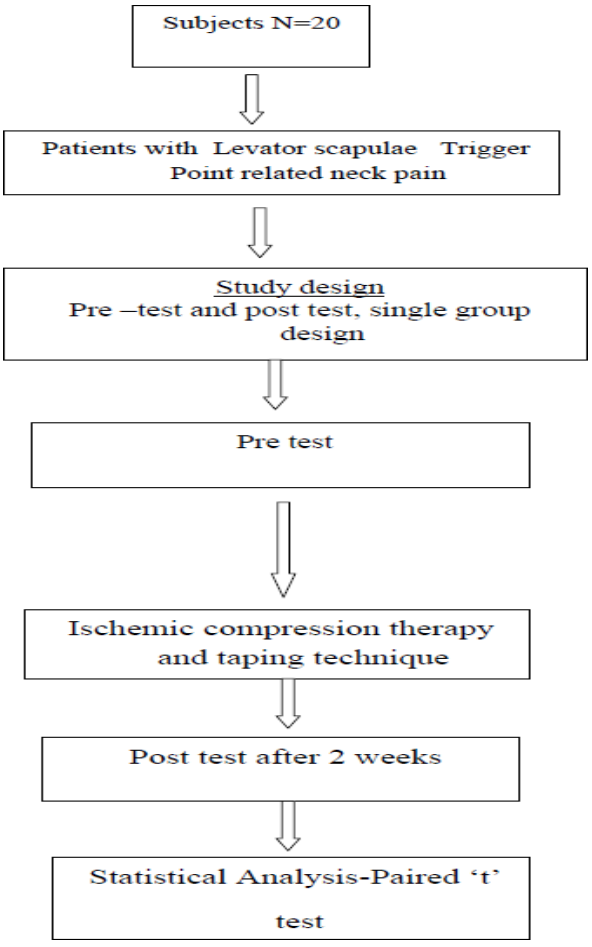
Ischemic Compression

Ischemic compression technique, pressure is applied slowly and progressively over the trigger point as the tension in the trigger point and its taut band sub sides. The pressure is maintained until the tenderness (or) tension is released.

Taping

Therapeutic taping techniques are techniques that utilize adhesive strapping tape as a component of the management of the patients with musculoskeletal conditions. (compact oxford dictionary 2009). Tape can be used clinically to reduce strain on damaged tissue provide support to facilitate correct the movement patterns and facilitate or inhibit the muscle activity [5].

MATERIALS AND METHODS



Study Design

The study design consists of experimental group with pretest and posttest evaluation.

Sample Design

Sample is selected by using consecutive sampling techniques.

Sample Population

The sample population include 20 patients.

Study Setting

Dept of Physiotherapy, Gurugram University, Gurugram

Study Duration

6 months

Criteria for Selection of Subjects

Inclusion criteria

Age: 20 - 40

Gender: Male and Female

Active and palpable myofascial trigger point on one side of the neck of levator scapulae.

Exclusion Criteria

More than 45 years

Clinical evidence of myelopathy or Radiculopathy

Fracture or dislocation of cervical vertebrae

Recent Neck and Shoulder Surgery patient

Non co – operated patients

Mentally retarded patient

Hyper sensitivity patient

Tumours of neck and shoulder

Skin infection like dermatitis

Loss of sensation

Open wounds in levator scapulae area

Variables

Independent variables

Ischemic compression technique

Taping technique

Dependent variables

Pain

Range of Motion (ROM)

Assessment Tool

Visual Analog Scale (VAS)

Goniometer

Visual analogue scale

Visual anolog scale is used to measure the severity of pain response that patients experience immediately after the completion of treatment.

It consists of 10 cm horizontal line labled as no pain (0) and severe pain (10).

The patients correspond to the severity of pain patient's experience.

Goniometer

Patient position – Sitting position

Axis – Vertex of the skull

Movable arm – tip of the nose

Stable arm – Imaginary connect the patients to acromian process

Procedure: Asking to turned the head of the patient activity and the range of motion measured by the therapist.

Treatment procedure

Treatment procedure

Ischemic compression technique

Patient position is supine lying or sitting position. The therapist relax the muscle first for palpating the trigger point. After locating the trigger point, a firm digital or knuckle compression applied to that area. The pressure will be gentle at the beginning and then gradually progress deeper into the tissue, but it not hurt patient.

Figure 2: shows the techniques of ischemic compression therapy

The ischemic compression will be maintained for 5 seconds and released for 2-3 second small amount of talcum powder will be applied over the trigger point, before the procedure in order to reduce the noxious skin friction. After this method will be brought to the position of comfort, following which unilateral stretching of levator scapulae will be done.

Taping Technique

First clean skin with alcohol and lay down non-sticky tape (typically Don Jolly fix tape) perpendicular to the levator scapulae muscle or remove the hair of the part.

Relax the levator scapulae muscle and palpate tender points.

Pull the tape towards the medial aspect of the scapulae, pull tight to obtain wrinkles in the skin.

Apply end of tape at the medial border of the scapulae.

Start lateral aspect of the scapula and end just medial to the spine [6].

Figure 3: shows taping application of levator scapulae trigger point related cervical pain

Results

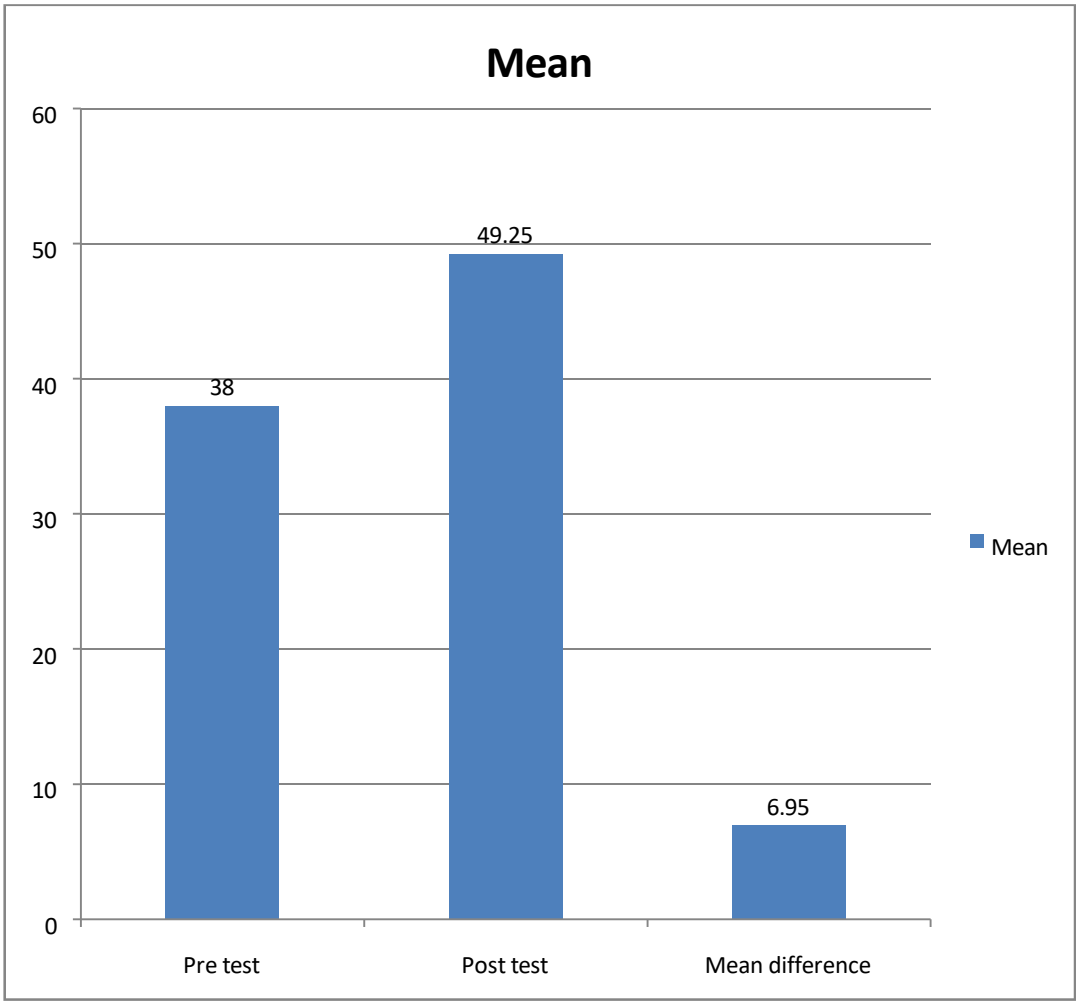
Data analysis of pain measurement

Table 1: shows difference between the pre test and post test values of experimental group recorded pain measurement by using Visual Analogue Scale (VAS)

Visual Analogue Scale				
Measurement	Mean	Mean difference	Standard deviation	'p' value
Pre test	6.8	2.55	1	11.40
Post test	4.25			

The't' test value for pre-test and post-test datas of experimental group was 11.40 and the table value was 2.861 at 0.005 level of significance. This shows that there exist a significance difference between pre-test and post-test valued of experimental group.

Figure: 2 Graphical representation of Mean and Mean difference of Active Range of Motion of cervical pain measured by goniometer



The number of twenty(20) subjects were selected based on the selection criteria and underwent pre test assessment by visual Analog Scale and goniometer to measure pain and active Range of motion of cervical rotation respectively. The subject were treated with ischemic compression and taping technique for two weeks. After the intervention the post test measures were measured.

In the statistical analysis, the calculated t value for the Visual Analog Scale was 11.40 which is greater than the table value 2.861 at 0.005 level. The active Range of Motion measurement the calculated t value is 7.23 which is greater than the table value 2.861 at 0.005 level of significance.

Hence, the calculated t value for pain and Active Range of Motion is more than the table value, the above values shows there is significant difference in both Pain and Active Range of Motion after the ischemic compression and taping techniques.

DISCUSSION

The findings of this study suggest that both taping and ischemic compression techniques are effective in reducing pain associated with levator scapulae trigger points in individuals suffering from cervical pain. This conclusion is supported by the significant improvement in the visual analogue scale (VAS) scores and cervical spine rotation measurements, as indicated by the paired t-test results. The pain reduction observed in this study aligns with similar findings in previous research, where ischemic compression has been reported to alleviate muscle tension and trigger point pain by increasing blood circulation and reducing muscle hypertonicity.

Furthermore, the use of taping as an adjunct therapy may provide additional support in managing musculoskeletal conditions, possibly by improving posture and reducing muscle strain. Previous studies have also highlighted the beneficial effects of taping in managing muscle-related discomfort, which complements the results found in this study.

While the results are promising, there are several limitations to consider. The sample size of 20 participants is relatively small, which may affect the generalizability of the results. Future studies could benefit from larger sample sizes, as well as a more diverse population, including individuals with varying severity levels of neck pain. Moreover, the study design did not include a control group, which would have helped to compare the effects of taping and ischemic compression techniques with other conventional treatments or no treatment at all.

The duration of the treatment and follow-up period were also not addressed in the current study. Long-term effects of taping and ischemic compression techniques need to be explored further to assess their sustainability in pain management. Future research could examine the impact of repeated treatments over an extended period to determine if the benefits persist or improve.

CONCLUSION

An experimental study was conducted to investigate the effectiveness of Ischemic compression and taping technique to reduce pain in levator scapulae related cervical pain patients.

20 patients were selected in this study consecutive manner. The levator scapulae trigger point pain assessed by Visual Analogue Scale. The limited Range of Motion of cervical pain assessed by goniometer.

The statistical result shows that the ischemic compression and taping technique is effective for the reduction of pain in levator scapulae trigger point related cervical pain patients.

This study aimed to compare the effectiveness of ischemic compression and taping techniques in alleviating cervical pain associated with trigger points in the levator scapulae muscle. The results of our analysis suggest that both treatment methods significantly reduce pain and discomfort in individuals with levator scapulae trigger points, with notable improvements in pain intensity, range of motion, and overall function. However, there were differences in the degree of efficacy between the two techniques. Ischemic compression appeared to offer more immediate pain relief, with participants reporting a more substantial reduction in pain intensity during and after treatment sessions. Taping techniques, on the other hand, provided longer-lasting benefits in terms of pain reduction and support, particularly in the maintenance of postural alignment and muscle function during daily activities.

While both interventions proved effective, clinicians may consider using ischemic compression for acute pain relief and taping as a complementary strategy for ongoing management of levator scapulae trigger point-related discomfort. Further studies with larger sample sizes and longer follow-up periods are needed to explore the long-term effects and potential synergistic benefits of combining these techniques.

Overall, this research contributes valuable insights into non-invasive therapeutic approaches for managing trigger point-related cervical pain, helping guide clinical decisions and improve patient outcomes.

Limitations

This study was very short term and therefore to make it more valid long term is necessary.

Since the study has been done with smaller number of subjects further studies should be conducted the large group of population.

Recommendation

Number of subjects may be increased,

More research in both interventions with consistent outcome measures,

Study can be done with different variables.

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