



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2022; 9(6): 08-14
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www.kheljournal.com
Received: 05-07-2022
Accepted: 10-08-2022

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A comparative study-effect of muscle energy technique versus myofascial release as treatment on trapizitis

Chaitra G

Abstract

Background and Objective: Trapezitis is an inflammatory pain arising from the trapezius muscle causing severe neck spasm, which is known as neck pain or stiffness around the neck and shoulder or upper back pain. It is increasingly becoming much more common among people working at desk, using computers and also those who do physical labor or use their neck and back muscles a lot to do strenuous works. Muscle energy technique and Myofascial release has been used in physiotherapy individually for treatment of trapezitis and proved effective in reducing pain and improve functional status of patient. The study proposed to compare the efficacy of muscle energy technique and myofascial release to treat trapezitis.

Method: 30 subjects were divided equally into two groups each containing 15 subjects of both sexes. The group A received muscle energy technique treatment and the group B received myofascial release treatment. The data was collected from all the patients on 1st day and on the 10th day of intervention by using two parameters, VAS and NDI.

Result: This study shows significant difference between groups i.e., group A (Muscle energy technique) and group B (Myofascial release). The mean±SD VAS for group A was 4.80±0.94 while that for group B was 3.93±1.09 with p value (< .041) and the mean±SD NDI for group A was 0.44±0.09 while that for group B was 0.31±0.17 with p value (< .015) showed statistically significant difference between the groups.

Conclusion: Based on this outcome Muscle energy technique is found to be more effective in reducing pain and improve functional status of the patient when compared with the Myofascial release in subjects with trapezitis.

Keywords: Trapezitis, muscle energy technique, myofascial release, VAS scale, Neck disability index

Introduction

The term “trapezitis” defined as an inflammatory pain arising from the trapezius muscle causing severe spasm around the neck and shoulder or upper back pain.

It is increasingly becoming much more common among people working at desk, using computers and also those who do physical labour or use their neck and back muscles a lot to do strenuous works. Some of the major reasons which lead to the pain include stress and fatigue to the muscle, bad posture is also termed as one of the major reasons of pain^[1].

An The Ratio of prevalence in males and females in India is 1:10. Two thirds of the general population have neck pain at some time in their lives and the prevalence is highest in middle age^[2].

The trapezius is a large paired trapezoid-shaped surface muscle that extends longitudinally from the occipital bone to the lower thoracic vertebrae of the spine and laterally to the spine of the scapula. It moves the scapula and supports the arm.

The trapezius has three functional parts: an upper part which supports the weight of the arm; a middle region, which retracts the scapula; and a lower part which medially rotates and depresses the scapula^[3].

The clinical features of trapezitis are:

- Headaches over the temples or base of the skull.
- Facial, jaw pain.
- Pain behind the eye.

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- Dizziness or vertigo.
- Severe neck pain.
- Neck stiffness
- Watching Television for prolonged periods.
- Upper shoulder region pain.
- Limited range of motion.
- Intolerance to weight on your shoulders.
- Referral pain on the back of the shoulder blade, inside of the arm, and into the ring and little fingers ^[4].

Functions of trapezius is to assist in mainly postural attributes, allowing and supporting the spinal column to remain erect when the person is standing and also used for active movements like side bending and turning the head, elevating and depressing the shoulders, and internally rotating the arm ^[5].

Trigger points are spots along a band of muscle. They feel like a knot in your upper back, shoulder, or neck. The trigger points may feel painful when touched, and the pain radiates beyond the immediate area.

Types of trigger points: active and latent. Active trigger points hurt when you move. Latent trigger points hurt when someone applies pressure along the raised part of the muscle ^[6].

Pathomechanics

Upper trapezius fibers initiate rotation of the clavicle to prepare for elevation of the shoulder girdle. Position which places trapezius in a shortened state for a period of time without rest shorten the fibers and lead to dysfunction and restricted movements of neck ^[7].

Risk Factors

- Lack of physical activity,
- Duration of daily computer use,
- Decrease in muscle strength
- Poor posture
- Anxiety
- Depression
- Neck strain
- Occupational injuries
- Sporting injuries
- Mechanical and degenerative factors ^[8].

Treatment for Trapezitis

- Muscle energy techniques for trapezius
- Positional release technique for trapezius.
- Theraband resisted exercises.
- Upper body strengthening exercises.
- Laser therapy
- Transcutaneous electrical stimulation
- Stretching
- Cold pack
- Postural technique by taping
- Ergonomic advice
- Medications ^[9].

Myofascial Release

Myofascial release is a soft tissue mobilization technique. It utilizes the stretching of the fascia and muscle to increase ROM or to decrease pain by breaking up the adhesions in the fascia. Fascia is the connective tissue and is divided into three different layers. First layer is superficial fascia consisting the connective tissue and adipose tissue. It provides a path for nerve and blood supply. Second layer is the potential space. This area can become inflamed, which shows that it can be

injured or stretched with any type of injury. Final layer is deep layer and is dense connective tissue that covers all the muscles and organs of the body.

Breaking the adhesions between the fascia and muscle allows the muscle and fascia to move smoothly over each other and helps alleviate the problem ^[10]. By this release there is a change in the viscosity of ground substance to a fluid state which decreases the fascia's excessive pressure on the pain sensitive structure and restores proper alignment ^[11].

This is achieved by relaxing contracted muscles, increases the circulation, increases both the venous and lymphatic drainage, and stimulates the stretch reflex of muscles and overlying fascia ^[12].

Muscle Energy Technique (MET)

It is a form of manual therapy, which uses a muscle's own energy in the form of gentle isometric contractions to relax the muscles via autogenic or reciprocal inhibition and lengthen the muscle. MET is technique in which the patient is an active participant. MET is based on the concepts of Autogenic Inhibition and Reciprocal Inhibition. If a sub-maximal contraction of the muscle is followed by stretching of the same muscle it is known as Autogenic Inhibition MET, and if a submaximal contraction of a muscle is followed by stretching of the opposite muscle then this is known as Reciprocal Inhibition MET. Post Isometric Relaxation (PIR) is the effect of the decrease in muscle tone in a single or group of muscles, after a brief period of submaximal isometric contraction of the same muscle. PIR works on the concept of autogenic inhibition ^[13].

Methodology

Source of data

Bangalore medical college research institute-super speciality hospital

Sample selection

- Population – subjects with trapezitis
- Sample size – 30 subjects.

Groups: Two groups

Group A: muscle energy technique 15 patients

Group B: Myofascial release 15 patients

- Sampling design – Simple random sampling.
- Study design: Comparative study with Pre-test to Post-test design.

A sample of 30 patients was assigned randomly into group A (MET and conventional therapy) N=15 and group B (myofascial release and conventional therapy) N=15 in 35-55 years age group. Samples were randomly chosen from the outpatient department observing the inclusion and exclusion criteria. A qualified orthopaedician diagnosed them having trapezitis. Patients were assessed by the use of an assessment performa.

Inclusion criteria

- Age group – 35 to 55 years
- Subjects with spasm and trigger points
- Taut band palpable over trapezius muscle
- Tender point along the length of the taut band of the trapezius muscle
- Restriction in cervical movements when measured

Exclusion criteria

- Traumatic Neck Injury
- Cervical Spinal Cord Compromise
- Cervical Radiculopathy
- Spondylolisthesis of the cervical spine
- A history of heart disease or the presence of a pacemaker
- Vertigo

Parameters: Assessment was conducted on the first day and the last day of the treatment session by using the following parameters.

- a) Neck disability index ^[14].
- b) Visual analog scale ^[15].

Neck disability index It is a valid tool to measure neck pain and disabilities in patients with neck pain due to acute or chronic conditions. There are 10 questions each scored with a possible 0-5 value with the larger number indicating a higher self-reported disability status. The score on this questionnaire can range from 0-50.

Procedure

Subjects who fulfil the inclusion criteria were included in the study. An informed consent was obtained from the subjects. The subjects were assigned into two groups, group A and group B by simple random sampling. Before the treatment initial pain level should be recorded by using VAS and Neck disability index in both groups.

Group A**Patients received MET**

The subjects lies supine, arm on the side to be treated lying along side the trunk, head /neck side bent away from the side being treated to just short of the restriction barrier, while therapist stabilizes the shoulder with one hand and cups the ipsilateral ear / mastoid area. With other hand. with the flexed neck fully side bent and fully rotated contra laterally, the posterior fibres of upper trapezius are involved in the contraction. This will facilitate subsequent stretching of this aspect of muscle. The various contraction and subsequent stretches can be performed with therapists arm crossed, hands stabilizing the mastoid area and shoulder. The effort towards the movement is important in order to introduce a contraction of the muscle from both ends simultaneously. The degree of effort should be mild and no pain should be felt. The contraction is sustained for 7 to 10seconds and upon complete relaxation of effort, the therapist gently eases the head/ neck into an increased degree of side bending and rotation, where it is stabilized, as the shoulder is stretched caudally. As stretching is introduced, the subject assist in this phase of treatment by initiating on instruction, "the stretch of the muscle" (as you breathe outplease slide your hands towards your feet). Once the muscle is in a stretched position, the subject relaxes and stretch is held for up to 30 seconds. 3 repetitions were given of MET and 10 sessions.

Group B

Patients received Myofascial-release

Position of the patient – sitting comfortably with supported back, elbow flexed with forearm placed on a pillow. A low load, long duration stretch is applied along the lines of maximal fascial restrictions. The fascia is palpated and the

pressure is applied directly to the skin, into the direction of restriction just until resistance (tissue barrier) is felt. The pressure is applied for 90 to120 seconds. This procedure is carried out without sliding over the skin or forcing the tissue until the fascia complex starts to yield and a sensation of softening is achieved. This is given for 10 sessions.

Results

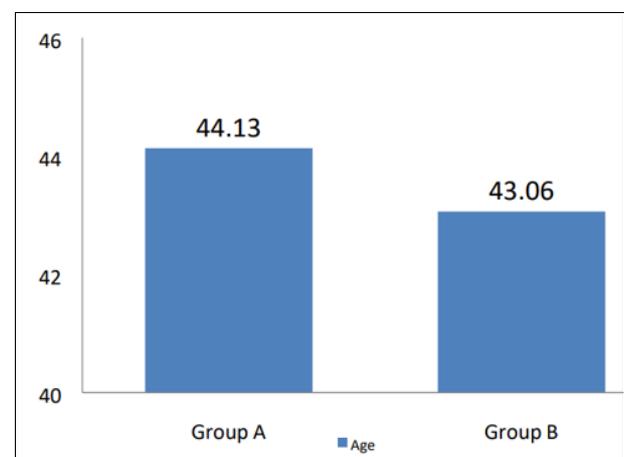
A comparative study with 30 trapezitis subjects out of which 15 were males and 15 were females randomized in 15 subjects in MFR and 15 subjects in Myofascial release is undertaken to study the effect based on VAS and neck disability index. All subjects fulfilled the inclusion and exclusion criteria.

Descriptive statistical analysis has been carried out by using SPSS version 17 in the present study and alpha value set at 0.05.

1. Unpaired t- test was used to test for age difference among both the groups.
2. Chi- square test was used to test for gender difference among both the groups.
3. Wilcoxon test was used to find out significant difference of VAS and NDI.
4. Mann Whitney U test was used to find out the significant difference in VAS and NDI between the groups. Microsoft word and Excel have been used to generate graphs, tables etc.

Table 1: Baseline data of demographic variables.

Sl. No	Variable	Group A	Group B	P value
1	Age	44.13±6.4	43.06±6.8	>.664
2	Sex (M/F)	6/9	9/6	>.273

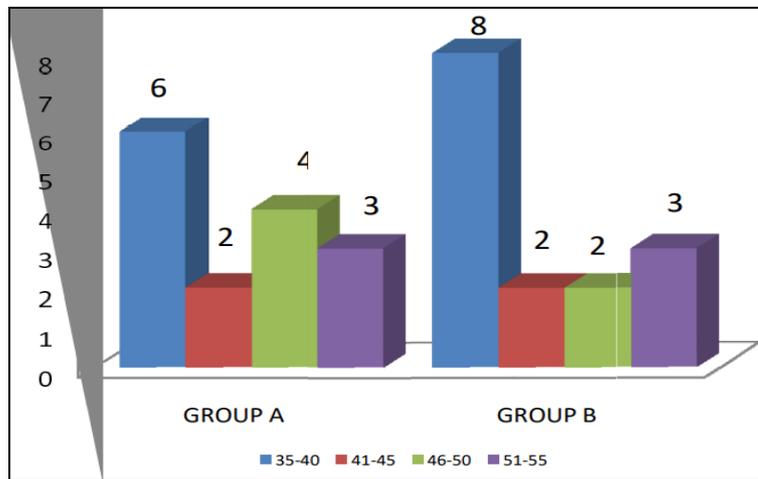


Graph 1: Base line data for demographic variables

In the study group A mean age was 44.13 with a SD of 6.4 where as in group 13 mean age was 43.06 with a SD of 6.8 and there was no significant difference among both groups (p value >0.664).

Table 2: Age Distribution of Subjects Studied

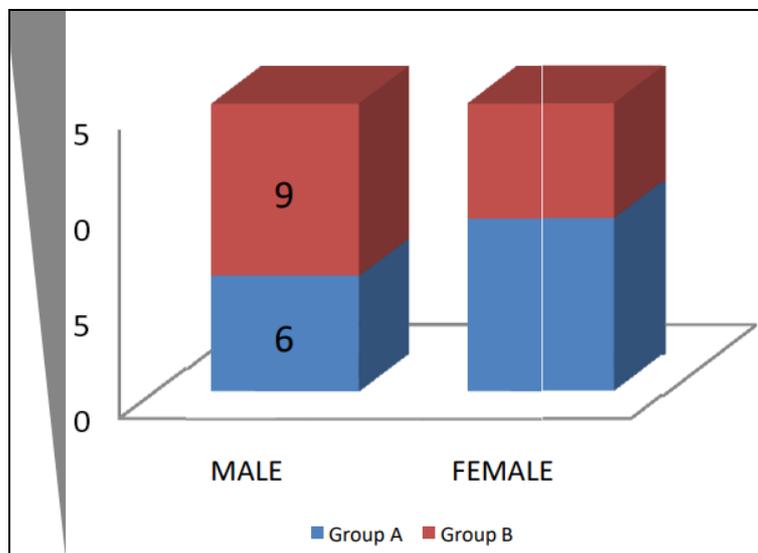
Age in years	Group A		Group B	
	No	%	No	%
35-40	6	40	8	53
41-45	2	13	2	13
46-50	4	27	2	13
51-55	3	20	3	20
Total	15	100	15	100



Graph 2a: Age distribution of subjects studied

In group A there were 6 subjects in 35-40 age group, 2 subjects in 41-45 age group, 4 subjects in 46-50 age group, 3 subjects in 51-55 age group. In group B there were 8 subjects

in 35-40 age group, 2 subjects in 41-45 age group, 2 subjects in 46-50 age group, 3 subjects in 51-55 age group.



Graph 2b: Gender distribution of subjects studied

There were 6 males and 9 females in group A and 9 males and 6 females in group B and the difference was not statistically

significant (p value >0.273).

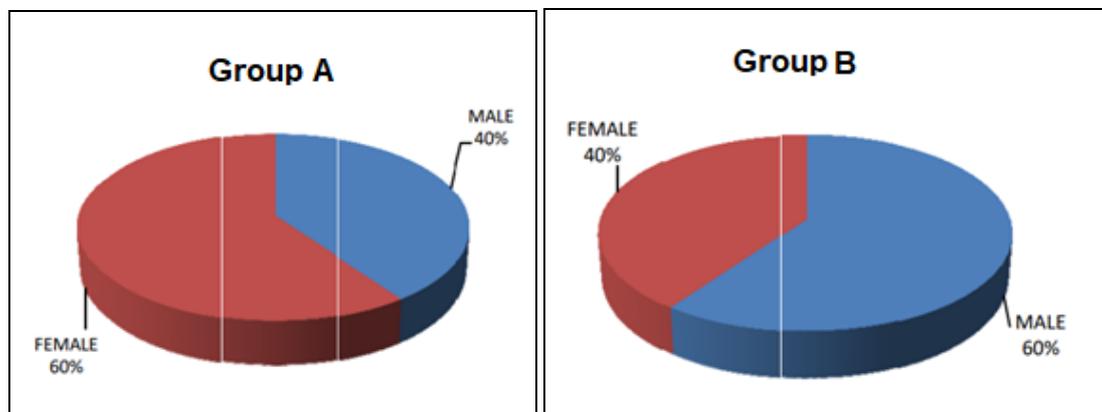
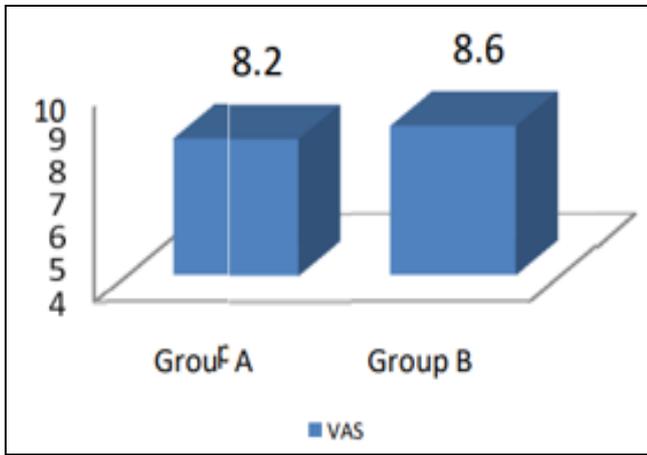
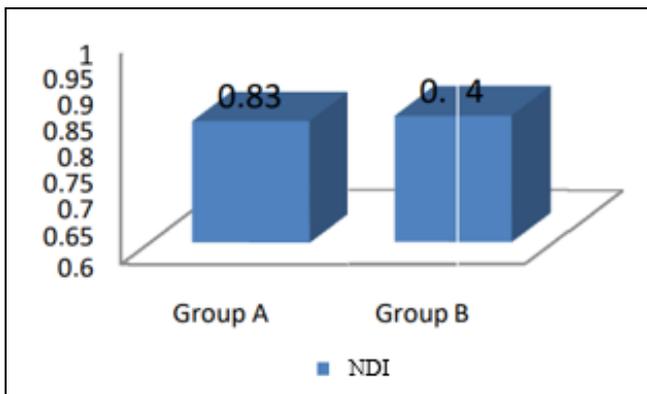


Table 3: Baseline data for outcome variables

Sl. No	Variable	Group A	Group B	P value
I	VAS	8.20±4.86	8.60±0.73	>.250
2	NDI	0.83±0.3	0.84±0.8	>.250



Graph 3a: Comparison of VAS between two groups



Graph 3b: Comparison of NDI between two groups

Data are mean (SD); p value are comparison of groups at baseline. The mean VAS was 8.2 with SD=0.86 in group A and the mean VAS was 8.6 with SD=0.73 in group B. The mean NDI was 0.83 with SD=0.3 and the mean NDI was 0.84 with SD=0.8 and there was no significant difference among both groups (p value >0.250).

Table 4: Effect of MET and Conventional Therapy on VAS and NDI

Sl.no	Variable	Pre	Post	P value
1	VAS	8.20±0.86	3.44±0.50	<.001
2	NDI	0.83±0.3	0.38±0.1	<.001

Table 5: Effect of MFR and Conventional Therapy on VAS and NDI

SL. No	Variable	Pre	Post	P value
1	VAS	8.60±0.73	4.66±1.1	<.001
2	NDI	0.84±0.8	0.53±0.15	<.001

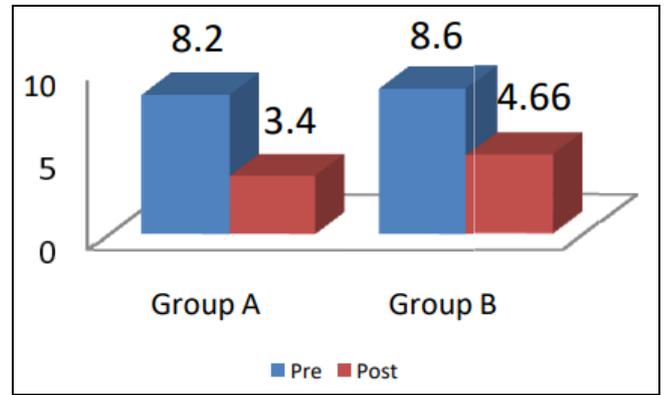
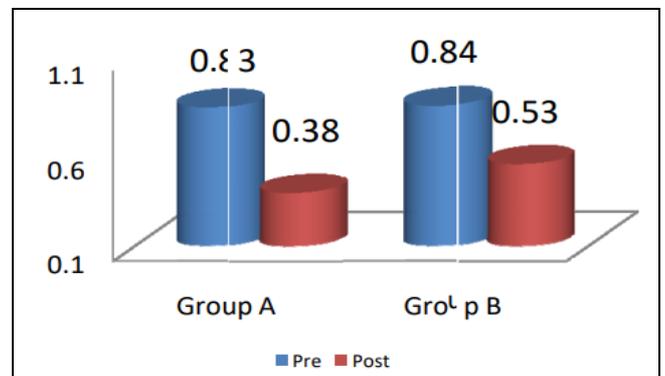


Fig 4: Comparison of VAS in the group

Data are mean (SD); P value are comparison with in the two groups. The pre mean score of VAS was 8.20 with SD:).86 and the post score was 3.4 with SD:).50 in group A and the difference is statistically significant (p value<.001).The pre mean score of VAS was 8.60 with SD).73 and the post score was 4.66 with SD=1.1 in group B and the difference is statistically significant (p value<.001).

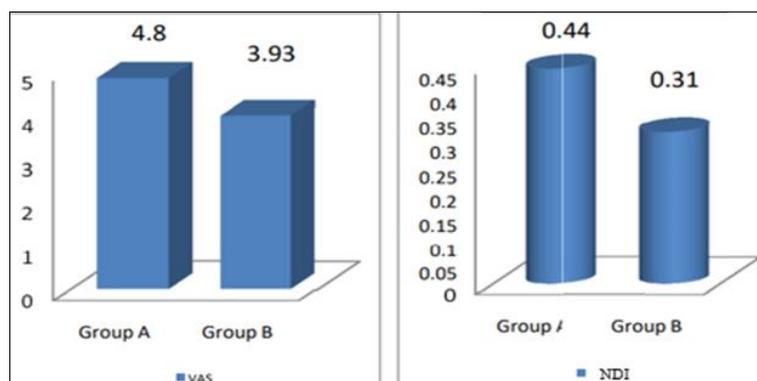


Graph 5: Comparison of NDI within the groups

Data are mean (SD); p value are comparison within the two groups. The pre mean score of NDI was 0.83 with SD =0.3 and the post score was 0.38 with SD =0.1 in group A and the difference is statistically significant (p value < 0.001). The pre mean score of NDI was 0.84 with SD =0.8 and the post score was 0.53 with SD =0.15 in group B and the difference statistically significant (p value < 0.001)

Table 6: Difference between groups

Sl.no	Variable	Group A	Group B	P value
1	VAS	4.80±0.94	3.93±1.09	2041
2	NDI	0.44±0.09	0.31±0.17	<.015



Graph 6: Difference between Groups

Data are mean (SD); p value are comparison between the two groups. The mean score of gain in improvement in VAS is 4.80 with SD=0.94 in group A and mean 3.93 with SD=1.09 in group B which is statistically significant (p value<.015).

Discussion

Trapezititis can be treated by various treatment techniques. Studies have been done on individual treatment and proved effective in reducing pain. MET and Myofascial release were proved effective in reducing pain individually. The study compared the effectiveness of 2 treatment strategies techniques in subjects with trapezititis, appeared that MET was effective than Myofascial release in decreasing pain and subjects showed clinically significant improvement.

In group A treated with MET mean VAS score reduced from 8.20 to 3.4 with the p value (<.001) showed statistically significant improvement. The mean NDI score reduced from 0.83 to 0.38 with the p value (<.001) showed statistically significant improvement. This study was supported by Aneri j Haveri (2018) [18] conducted a study on comparison of effectiveness of myofascial release technique versus muscle energy technique on chronic trapezititis. The effects of MET component for increase in ROM post intervention can be explained on the basis of physiological mechanisms behind the changes in muscle extensibility - reflex relaxation, viscoelastic change, and changes to stretch tolerance. Reflex muscle relaxation following contraction that has been proposed to occur by activation of the golgi tendon organs and their inhibitory influence on the a-motor neuron pool. The possible mechanism for the reduction in pain in the MET group can be attributed to the hypo analgesic effects which can be explained by the inhibitory Golgi tendon reflex, activated during the isometric contraction that leads to reflex relaxation of the muscle. Activation of muscle and joint mechano receptors leads to sympatho excitation evoked by somatic efferents and localized activation of the pre aqueductal gray matter that plays a role in descending modulation of pain.

This study was supported by Reema Joshi (2017) [19] conducted a study on the effect of Post-isometric relaxation versus Positional release technique on pain and function in patients with non-specific neck pains. 30 subjects aged between 20-50 years were included in the study. NPRS and NDI were the outcome measures in the study. It was concluded that MET was more effective than Positional release technique.

In group B treated by Myofascial release shown mean VAS score reduced from 8.60 to 4.66 with the p value (<.001) showed statistically significant improvement. The mean NDI score reduced from 0.84 to 0.53 with the p value (<.001) showed statistically significant improvement. This is in accordance with a study done by Suman kuhar, who found out that Myofascial release is an effective therapeutic option in the treatment of trapezititis. The pain is reduced as there is change in viscosity the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain sensitive structure and restores proper alignment and there is increase in circulation and increase in venous and lymphatic drainage [16].

However, the statistics shows significant difference between groups i.e., group A (MET) and group B (Myofascial release). The mean \pm SD VAS for group A was 4.80 \pm 0.94 while that for group B was 3.93 \pm 1.09 with p value (<.041) and the mean \pm SD FFI for group A was 0.44 \pm 0.09 while that for group B

was 0.31 \pm 0.17 with p value (<.015) showed statistically significant difference between the groups. The study showed the result where MET was found to be more effective in reducing pain when compared with the Myofascial release in subjects with trapezititis.

Conclusion

It can be assumed that both MET and Myofascial release is effective in reducing pain. But the outcome of this study with significant statistical improvement seen in MET on the outcome variables than Myofascial release will lead us to the conclusion of accepting the experimental hypothesis which could be stated as MET is effective in reducing pain than Myofascial release.

As there is statistically significant difference between MET and myofascial release therapy the experimental hypothesis is accepted. The study could be concluded as "There is significant difference produced in the MET than myofascial therapy in reducing pain in subjects with trapezititis."

Limitations

- The follow-up to see the long-term effects of these techniques is not done.
- Our sample size was small, and data were collected at one outpatients' hospital, limiting the generalizability of the findings.
- The study is of short-term duration.
- Pain relieving modality is not given.
- Home exercises could have been advised.

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