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Snehal Desai
BPTTh student, Modern college
of Physiotherapy, Pune,
Maharashtra, India

Dr. Kiran Jeswani
Associate Professor, Modern
college of Physiotherapy, Pune,
Maharashtra, India

To compare the effect of myofascial release and ischaemic compression on pain, cervical lateral flexion and function in acute Trapezitis in young adults

Snehal Desai and Dr. Kiran Jeswani

Abstract

Background and Objectives: Trapezitis is a classic stress pain of the trapezius muscle and it is the most common musculoskeletal disorder. The upper trapezius muscle is designated as postural muscle and it is highly susceptible to overuse. Bad posture is frequently incriminated as the cause of trapezitis. Trapezitis involves myofascial pain syndrome which is characterized by trigger points. Myofascial trigger points (MTrP) are defined as hyperirritable spots within taut bands of skeletal muscle fibers. The syndrome is associated with tenderness in the muscle, characteristic referred pain, spasm and restriction of motion. Physiotherapy techniques like Myofascial release technique and Ischaemic compression have been proposed as an adjunct to conventional therapy to treat trapezitis. Myofascial release acts by relaxing contracted muscles, increasing circulation and lymphatic drainage, and stimulating the stretch reflex of muscles and overlying fascia. Ischaemic compression involves applying direct sustained digital pressure to the Trigger point with sufficient force over dedicated time duration, to slow down the blood supply and relieve the tension within the involved muscle. This study is determined to study and compare the effect of MFR and Ischaemic compression in acute trapezitis.

Study Design: Comparative study.

Setting: Out patient physiotherapy departments in and around Pune.

Outcome Measures: Visual analogue scale (VAS), Cervical ROM, Neck disability index (NDI).

Method: 30 subjects with unilateral acute trapezitis were selected on the basis of inclusion and exclusion criteria and randomly assigned in two groups, Group A and Group B after taking informed consent. Group A received Myofascial release along with conventional physiotherapy and Group B received Ischaemic compression along with conventional physiotherapy for 10 sessions over a period of two weeks.

Result: The study showed significant reduction in pain and improvement in cervical lateral flexion and neck disability in both the groups. Inter-group comparison showed Myofascial release technique to be superior in reducing pain and improving cervical lateral flexion and neck disability in young adults with acute trapezitis.

Keywords: Trapezitis, Trigger points, Myofascial Release, Ischaemic compression, Neck disability index

1. Introduction

Trapezitis is a classic stress pain of the trapezius muscle and it is the most common musculoskeletal disorder. It is usually caused by placing too much stress or strain over the trapezius muscle. The upper trapezius muscle is designated as postural muscle and it is highly susceptible to overuse. Bad posture is frequently incriminated as the cause of trapezitis. Watching television or working on a computer with an awkward posture or even use of a thick pillow can cause neck spasm. The stress that gives rise to this condition is often a combination of tension on, and contraction of, the muscle Trapezius muscles help with the function of neck rotation, side bending and extension. Tightness in the muscles can decrease the range of motion of the neck. The decrease in motion can negatively affect the mobility of the cervical joints. Limited range of motion creates an increase in soft tissue tightness, with an ensuing pain-spasm cycle which can be difficult to break ^[1].

Trapezitis involves myofascial pain syndrome which is characterized by trigger points. Myofascial trigger points (MTrP) are defined as hyperirritable spots within taut bands of skeletal muscle fibers.

Correspondence
Snehal Desai
BPTTh student, Modern college
of Physiotherapy, Pune,
Maharashtra, India

The syndrome is associated with tenderness in the muscle, characteristic referred pain, spasm and restriction of motion. Myofascial trigger point is clinically classified as active or latent. An active MTrP presents spontaneous pain at rest, during movement and direct compression, whereas latent MTrP, without spontaneous pain, shows only pain and discomfort in response to compression [2].

Treatment of trapezitis requires a multifaceted approach. In the short term, the aim is to abolish the taut bands, trigger points and tender points for pain relief. In the long term flexibility has to be restored to the muscle so as to reduce the recurrence rate. Combination of manual therapy, modalities and exercises appears to be effective for trapezitis and spasm.

Myofascial Release technique is used treating patients with trigger points on trapezius. It acts by relaxing contracted muscles, increasing circulation and lymphatic drainage, and stimulating the stretch reflex of muscles and overlying fascia [4].

Ischaemic compression is a manual therapy technique which is frequently employed as a means of deactivating Trigger point. It involves applying direct sustained digital pressure to the Trigger point with sufficient force over dedicated time duration, to slow down the blood supply and relieve the tension within the involved muscle. The pressure is gradually applied, maintained and then gradually released [3].

2. Objectives

1. To study the effect of Myofascial release on Pain, Cervical lateral flexion and Function in Acute trapezitis in young adults.
2. To study the effect of Ischaemic compression on Pain, Cervical lateral flexion and Function in Acute trapezitis in young adults.
3. To compare the results of both the techniques on Pain, Cervical lateral flexion and Function in Acute trapezitis in young adults.

3. Hypothesis

Null hypothesis (H0) - There is no difference between the effects of Myofascial release and Ischaemic compression in acute trapezitis in young adults.

Alternate hypothesis (H1) - Myofascial release is more effective than Ischaemic compression in acute trapezitis in young adults.

Alternate hypothesis (H2) - Ischaemic compression is more effective than Myofascial release in acute trapezitis in young adults.

4. Review of Literature

1. Hugh Gemmell (2007) conducted a study to determine the Immediate effect of ischaemic compression, trigger point pressure release and placebo ultrasound on pain, degree of cervical lateral flexion and pressure pain threshold of upper trapezius trigger points in subjects with non-specific neck pain.

Forty five subjects from the AECC student body between 18 and 55 years of age with non-specific neck pain of at least 30 mm on a visual analogue scale (VAS) for pain, an upper trapezius trigger point and decreased cervical lateral flexion to the opposite side of the active upper trapezius trigger point were entered into the study.

Ischaemic compression was found superior to sham

ultrasound in immediately reducing pain in patients with non-specific neck pain and upper trapezius trigger points [3].

2. Chuen-Ru Hou (2002) conducted a study on immediate effects of various physical therapeutic modalities on cervical myofascial pain and trigger point sensitivity suggested that though various therapeutic combinations are effective, concluded that myofascial release therapy provides as an alternative treatment using either low pressure and a long duration (90s) or high pressure and short duration (30s) for immediate pain relief and trigger point sensitivity suppression [16].
3. Sneha Helen Devadas (2012) conducted a study to compare effectiveness of Myofascial release versus Positional release technique in patients with unilateral trapezitis measuring VAS, Cervical ROM and neck disability and found myofascial release to be better than positional release technique [1].
4. Ahmed Mohamed Abdelhamid *et al.* conducted a study Ischaemic compression versus Traditional Physical Therapy in treatment of chronic mechanical neck pain on 40 patients randomly divided into 2 groups. Both groups were given the treatment regimens for 2 weeks. Pain, Cervical range of motion and function were evaluated before and after study. Ischaemic compression was found to be more effective than traditional therapy in improving pain, CROM and function in patients with chronic neck pain [9].

5. Methodology

Study design- Comparative study

Sample size- 30

Sampling design-simple random sampling

Study population- Young adults in the age group 18-30 diagnosed with acute trapezitis

Study setting- Outpatient physiotherapy departments in pune

Study Duration- 6 months

6. Inclusion and Exclusion Criteria

Inclusion Criteria

1. Young adults of ages 18-30 diagnosed with acute trapezitis.
2. Condition present for not more than 3 months
3. Both males and females
4. Visual analogue scale reading of not less than 3mm
5. Restriction in cervical lateral flexion

Exclusion Criteria

1. Chronic trapezitis of more than 3 months
2. Traumatic Neck Injury.
3. Fracture of cervical vertebrae
4. Cervical Radiculopathy.
5. Any degenerative condition of the cervical spine

7. Materials

1. Chair
2. Pillows
3. Goniometer
4. Consent form
5. Neck disability index

8. Outcome Measures

1. **Visual Analogue Scale:** Patients will be asked to rate pain intensity by placing a mark on a 100-mm VAS. The VAS is horizontally positioned with the extremes

labeled “least possible pain” and “worst possible pain”. VAS is a highly reliable instrument for measurement of acute pain [18]

2. **Cervical Range of Motion:** Cervical lateral flexion of the opposite side will be recorded with a universal goniometer. UG is cheap, easy to use, popular instrument. Its validity and reliability is high in clinical settings [17].
3. **Neck Disability Index (NDI):** The Neck Disability Index (NDI) was developed in the late 1980’s by Dr. Howard Vernon. The NDI consists of 10 items, each with a score up to 5, for a total score of 50. The lower the score, the less self-rated disability. The NDI has been shown to be highly valid and reliable [15].

9. Sampling and Study Design

The subjects were randomly assigned to groups using chit method.

Group A was treatment group receiving Myofascial release along with conventional physiotherapy.

Group B was treatment group receiving Ischaemic compression along with conventional physiotherapy.

10. Procedure

Thirty subjects fulfilling the inclusion and exclusion criteria diagnosed with acute trapezititis were considered for the study. The study population consisted of individuals between 18 and 30 years of age. After explaining the subjects about the treatment, written consent was taken. Pre-assessment was taken prior to the commencement of treatment with self-report outcome measures of VAS, neck disability index, and cervical lateral flexion range of motion of opposite side with goniometry. The subjects were divided into group A receiving MFR and group B receiving Ischaemic compression along with conventional physiotherapy.

10.1. Conventional Protocol: Ultrasound- It is a noninvasive method which consists of piezoelectric crystals that convert the electrical energy to mechanical oscillation energy using high-frequency alternating current (van der Windt, 1999). Therapeutic ultrasound: applied to the trapezius muscle area, mode- continuous, Intensity- variable according to pain threshold but within 1.5 watts/cm², Range- 0.1 to 1.5 watts/ cm², Treatment time- 5 mins and patient position- high sitting with back rest [5].

Stretching exercises for trapezius

1. For upper trapezius, the head is tilted passively toward the opposite side with the face turned to the same side, putting the muscle on maximum stretch. For most effective self-stretch, the patient must place the head in the same position and use the hand on the opposite side to gently but firmly add stretch tension.
2. For lower trapezius, stretch is conveniently applied in the seated position. The operator grasps the patient's

- arm and brings the elbow across the chest while lifting slightly to fully protract and elevate the scapula in order to maximally stretch the lower trapezius fibers
3. stretches are given for 30 seconds each with 15 second rest [2]
4. Group A received Myofascial release along with ultrasound and stretching.
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 [1]. The therapy was given for 5 minutes.
5. Group B received Ischaemic compression along with ultrasound and stretching. A sustained deep pressure with the thumb to the upper trapezius TrP for 30 s—1 min is applied. Pressure is released when there is decreased tension in the TrP or when the TrP is no longer tender or one minute had elapsed, whichever occurs first [2].

11. Data and Statistical Analysis

Statistical analysis was conducted using INSTAT™ for Windows.

The difference in pre and post treatment values of VAS, cervical lateral flexion ROM and NDI was compared within the groups by paired t test.

The post treatment comparison between the two groups was done by using unpaired t test.

1. Demographic and baseline characteristics for each group at the beginning of the study.

Table 1: Demographic data and baseline characteristics for each group (pre study)

	GROUP A (n=15)	GROUP B (n=15)
AGE	23.6±3.158	24.26±2.219
VAS	7.2±0.9411	7±1
LAT.FLEXION ROM	28.33±2.193	29.6±3.334
NDI SCORE	28.53±2.066	27.67±2.82

2. VAS

The intra group comparison between the values obtained on VAS in both the groups shows a significant reduction in means of VAS values(0.4667±0.5164 from 7.2±0.9411 in group A and 0.9333±0.5936 to 7±1 in group B) after the treatments of both the groups.

Table 2: Intra group comparison of pre-treatment and post treatment values of VAS of both the groups

	GROUP A	GROUP B
PRE TREATMENT	7.2±0.9411	7±1
POST TREATMENT	0.4667±0.5164	0.9333±0.5936
t value	25.250	28.750
P value	0.00	0.00
significance	Highly significant	Highly significant

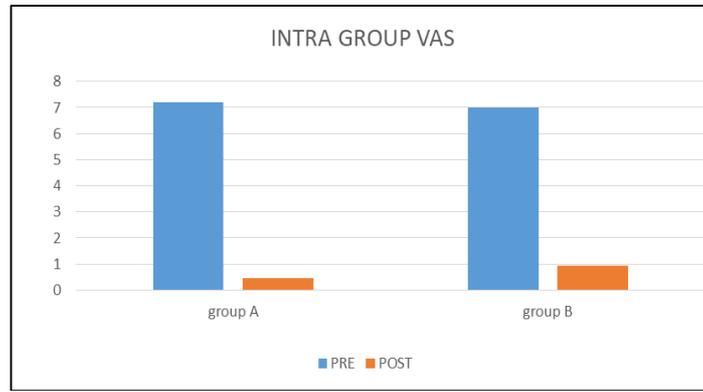


Fig 1: Intra group comparison of pre-treatment and post treatment values of VAS

The inter group comparison of VAS values of both the groups after treatment show a significant difference. The mean value of post treatment VAS in group A (0.4667 ± 0.5164) is lesser than group B (0.9333 ± 0.5936) indicating more improvement in pain in group A than group B.

Table 3: Comparison between post treatment values of VAS of group A and B

	GROUP A	GROUP B	T value	P value	RESULT
MEAN VAS	0.4667 ± 0.5164	0.9333 ± 0.5936	2.297	0.0146	SIGNIFICANT

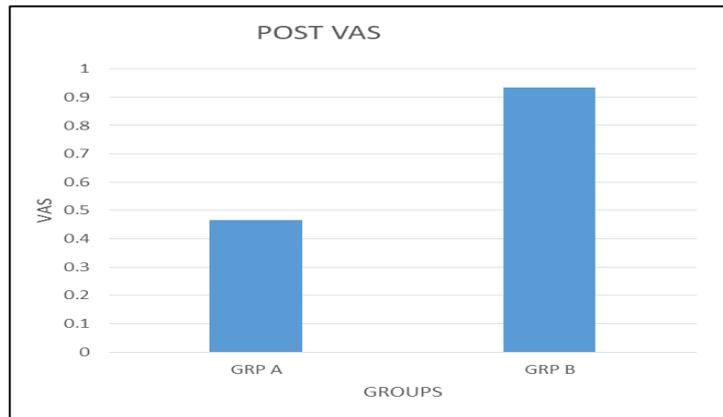


Fig 2: Comparison of post treatment values of VAS of both groups.

3. Cervical Lateral Flexion Rom

The pre-treatment ROM measures showed significant improvements in both the groups post treatment. Mean of

group A increased to 39.4 ± 2.098 from 28.33 ± 2.193 while that of group B increased to 37.87 ± 1.767 from 29.6 ± 3.334

Table 4: Comparison of pre and post treatment values of Cervical lateral flexion of both groups respectively

	GROUP A	GROUP B
MEAN PRE ROM	28.33 ± 2.193	29.6 ± 3.334
MEAN POST ROM	39.4 ± 2.098	37.87 ± 1.767
T value	15.807	12.703
P VALUE	0.00	0.00
RESULT	SIGNIFICANT	SIGNIFICANT

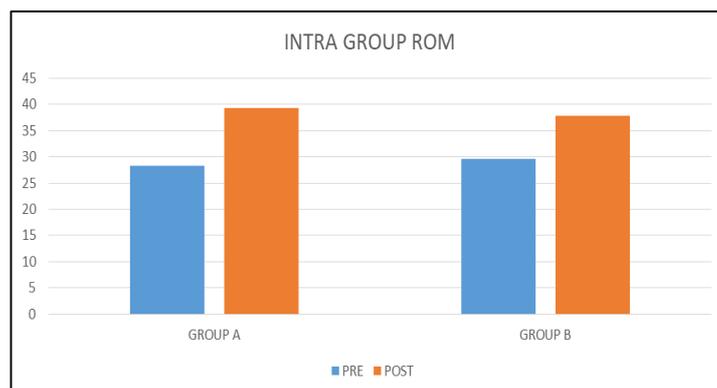


Fig 3: Comparison of pre and post treatment values of Cervical lateral flexion of both groups respectively

The inter group comparison of cervical lateral flexion range of both the groups showed significant difference. Post treatment mean of group A (39.4 ± 2.098) being more than group B (37.87 ± 1.767) indicates more improvement in lateral flexion of group A of MFR than Ischaemic compression.

Table 5: Comparison of post treatment values of Cervical lateral flexion of both groups.

	Group A	Group B	T value	P value	result
Mean ROM	39.4 ± 2.098	37.87 ± 1.767	2.165	0.0195	SIGNIFICANT

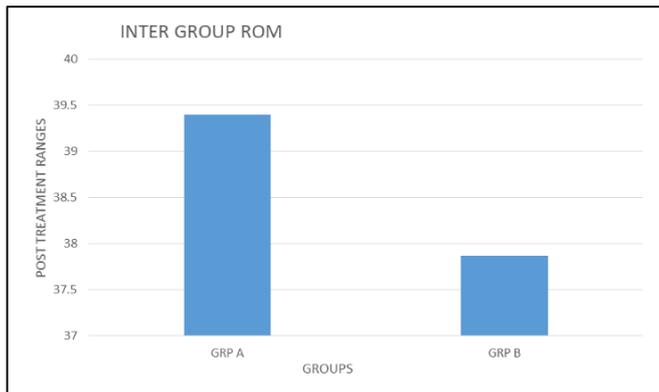


Fig 4: Comparison of post treatment values of Cervical lateral flexion of both groups.

4. neck disability index

The intra group comparison of pre and post values of each group show significant improvement of neck disability in individuals of both the groups. Both the treatments significantly decreased the disability of the individuals.

Table 6: Comparison of pretreatment and post treatment values of neck disability scores of both groups respectively.

	GROUP A	GROUP B
MEAN PRE VALUE	28.53 ± 2.066	27.67 ± 2.82
MEAN POST VALUE	10.07 ± 0.2582	10.47 ± 0.5164
T VALUE	33.521	23.940
P VALUE	0.00	0.00
RESULT	SIGNIFICANT	SIGNIFICANT

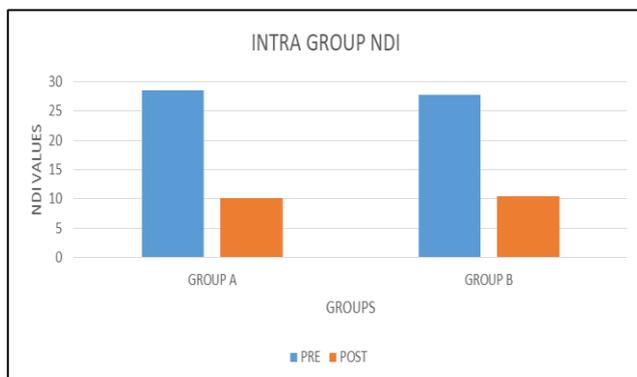


Fig 5: Comparison of pretreatment and post treatment values of neck disability scores of both groups respectively.

The comparison between post treatment NDI values of both the groups showed more improvement of neck disability in subjects treated by MFR than Ischaemic compression. The mean value of group A (10.07 ± 0.2582) is lesser than group B (10.47 ± 0.5164)

Table 7: Comparison of post treatment values of neck disability scores of both groups.

	GROUP A	GROUP B	T value	P VALUE	RESULT
POST TREATMENT MEANS	10.07 ± 0.2582	10.47 ± 0.5164	2.683	0.006	HIGHLY SIGNIFICANT

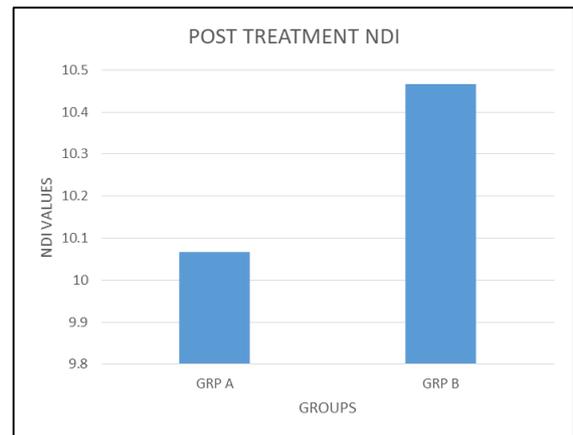


Fig 6: Comparison of post treatment values of neck disability scores of both groups.

12. Result

30 subjects were randomly assigned to two treatment groups, Group A receiving myofascial release and Group B receiving Ischaemic compression along with conventional physiotherapy treatment. Treatment values of VAS, cervical lateral flexion and NDI were recorded. The pre and post Within group analysis using paired t test revealed a statistically significant ($p < 0.05$) difference among both the groups between pre-test and post test scores. The intra group comparison between the values obtained on VAS in both the groups shows a significant reduction in means of VAS values (0.4667 ± 0.5164 from 7.2 ± 0.9411 in group A, $p=0.00$ and 0.9333 ± 0.5936 to 7 ± 1 in group B, $p=0.00$) The mean value of post treatment VAS in group A (0.4667 ± 0.5164) is lesser than group B (0.9333 ± 0.5936), $p=0.0146$ indicating more improvement in pain in group A than group B.

The pre-treatment ROM measures showed significant improvements in both the groups post treatment. Mean of group A increased to 39.4 ± 2.098 from 28.33 ± 2.193 , $p=0.00$ while that of group B increased to 37.87 ± 1.767 from 29.6 ± 3.334 , $p=0.00$ The inter group comparison of cervical lateral flexion range of both the groups showed significant difference. Post treatment mean of group A (39.4 ± 2.098) being more than group B (37.87 ± 1.767), $p=0.0195$ indicates more improvement in lateral flexion of group A of MFR than Ischaemic compression.

The intra group comparison of NDI values in both groups showed significant decrease in both groups. (10.07 ± 0.2582 from 28.53 ± 2.066 in group A, $p=0.00$ and 10.47 ± 0.5164 from 27.67 ± 2.82 in group B, $p=0.00$). The comparison between post treatment NDI values of both the groups showed more improvement of neck disability in subjects

treated by MFR than Ischaemic compression. The mean value of group A (10.07 ± 0.2582) is lesser than group B (10.47 ± 0.5164) with p value = 0.006

MFR proved to be more effective in all variables of both groups.

Table 8: Within and between groups comparisons of VAS, Cervical lateral ROM and NDI mean values (T and P values)

VARIABLE	GROUP	PRE	POST	T VALUE	P VALUE
VAS	A	7.2±0.9411	0.4667±0.5164	25.250	0.00**
	B	7±1	0.9333±0.5936	22.750	0.00**
	t value	0.5641	2.297		
	p value	0.2886	0.0146*		
CERVICAL LATERAL FLEXION ROM	A	28.33±2.193	39.4±2.098	15.807	0.00**
	B	29.6±3.334	37.87±1.767	12.703	0.00**
	t value	1.229	2.165		
	p value	0.1146	0.0195*		
NDI	A	28.53±2.066	10.07±0.2582	33.521	0.00**
	B	27.67±2.82	10.47±0.5164	23.940	0.00**
	t value	0.9602	2.683		
	p value	0.1726	0.006**		

*-significant **-highly significant (group A-Myofascial release group B-Ischaemic compression)

13. Discussion

In this study we compared the effectiveness of Myofascial release and Ischaemic compression on acute trapezitis in young adults between the age groups 18 and 30. The result shows that both the techniques were effective in reducing pain and neck disability and increasing cervical lateral flexion in the tested subjects. The effect of MFR was more than that of Ischaemic compression. The comparison of post treatment values of VAS, Cervical lateral flexion and neck disability scores showed a significant difference with results of Group A i.e Myofascial release technique being better than Group B i.e Ischaemic compression.

Myofascial Release technique is used treating patients with trigger points on trapezius. A myofascial TP is defined as "a hyperirritable spot, usually within a taut band of skeletal muscle or in the muscle's fascia, that is painful on compression and that can give rise to characteristic referred pain, tenderness, and autonomic phenomena" [2]. MTrPs can either be active or latent. A latent MTrP (tender but non painful) can be converted into an active one (tender and painful) by any pathological lesion. After appropriate treatment the MTrP can be deactivated [21].

MFR acts by relaxing contracted muscles, increasing circulation and lymphatic drainage, and stimulating the stretch reflex of muscles and overlying fascia. This helped to increase soft tissue extensibility which improved range of motion [4].

Shridhar *et al.* (2014) conducted a study comparing MFR and PRT in individuals with unilateral trapezitis and found MFR to be significantly superior in treating trapezitis. Myofascial release is the interactive stretching techniques that require feedback from the patient's body to determine the direction, force and duration of the stretch and to facilitate maximum relaxation of tight or restricted tissue. It acts on the taut bands and sarcomere shortening which activate the latent MTrPs and effectively decreases the restriction by application of a continuous load over the area of the muscle [21]. This supports the findings of the study of MFR being effective in reducing pain and disability and increasing range of individuals with acute trapezitis.

Ischaemic compression proved to be effective in improving the pain, range and disability in the tested group significantly though less than that of MFR.

Gemmell *et al.* worked with subjects with nonspecific neck pain, three treatment groups (IC, pressure release, and sham US) were created for the treatment of active MTrPs of the trapezius muscle. Ischaemic compression was found to be more effective in treating MTrPs. These results and the results of our study coincide with the fact that neck pain and AROM show improvement after performing a pressure stimulus (Gemmell *et al.*, 2008) [3].

Ischemia means a lack of blood supply, with associated tissue irritation and congestion. Ischemic compression is used in trigger point work. The purpose of ischemic compression is to deliberately increase the blockage of blood to an area so that, upon release, there will be a resurgence of blood. This washes away waste products, supplies necessary oxygen and helps the affected tissue to heal. This increase of blood flow to the area is called a hyperaemia [22].

Immediately after release, blanching of the skin is followed by reactive hyperemia at the site of pressure. Some therapists apply less pressure for a shorter time, but with repeated applications on successive days until TP tenderness is obliterated and the referred pain disappears therefore resulting in reduction in pain [2].

14. Limitations

The study was conducted on small population of 30 individuals.

Subjects could not be followed up after study duration.

The universal goniometer was used in the study by a manual investigator so errors were unavoidable.

15. Future Scope

It can be further studied on a larger population.

Study can be specified on a particular population showing significant prevalence of trapezitis ex. Individuals working in corporate sectors.

The study can be specified on a particular gender, The study can include other age groups.

16. Conclusion

MFR and Ischaemic compression are both effective in treating acute trapezitis in young adults, MFR is more effective than Ischaemic compression on Pain, cervical lateral flexion and neck disability in acute trapezitis in young adults.

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