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Effect of active release technique versus deep ischaemic compression on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper Trapezitis: A comparative study

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Abstract

Background and Objectives: Trapezitis is an inflammatory pain arising from the trapezius muscle and it is the most common musculoskeletal disorder. Trapezitis is usually caused by the placing too much stress over the trapezius muscle. The upper trapezius muscle is the postural muscle and is highly susceptible to over use. Bad posture is the noted cause of trapezitis. Trapezitis involves myofascial pain syndrome which is characterized by trigger points. The syndrome is associated with tenderness in the muscle, spasm and restriction of range of motion. Physiotherapy techniques like Active Release Technique (ART) and Deep Ischaemic Pressure have been proposed as an adjunct to conventional therapy to treat trapezitis. Active Release Technique acts as restoring free and unimpeded movement of soft tissue, the release of entrapped nerves, vasculature and lymphatics, re-establishing optimal texture, resilience and function of soft tissue. Deep Ischaemic Pressure 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 tension within the involved muscle. This study is determined to study and compare the effect of ART and Deep Ischaemic Pressure in chronic trapezitis.

Study Design: Comparative Study

Setting: Out patient physiotherapy departments in around Pune

Outcome Measures: Visual Analogue Scale (VAS), Cervical ROM (Goniometer), Neck Disability Index (NDI)

Method: 40 subjects with chronic bilateral upper 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 active release technique along with conventional physiotherapy. Group B received deep ischaemic pressure along with conventional physiotherapy. Both the groups received 7 treatment sessions for 2 weeks.

Results: The study showed significant reduction in pain and improvement in cervical lateral flexion and neck disability in oth the groups. Inter group comparison showed Active Release Technique to e superior in reducing pain and improving in cervical lateral flexion and neck disability in young adults with chronic bilateral upper trapezitis.

Keywords: Ischaemic compression, pain, cervical lateral flexion, functional

Introduction

Trapezitis is an inflammatory pain arising from the trapezius muscle and it is the most common musculoskeletal disorder. Trapezitis is usually caused by the placing too much stress over the trapezius muscle. The upper trapezius muscle is the postural muscle and is highly susceptible to over use [1] Bad posture is the noted cause of trapezitis. Prolonged use of computers during daily work activities and recreation leads to adaptation of faulty posture. Watching television or even use of thick pillow can cause neck pain. Interruptions of low frequency in the muscle activity during repetitive task are associated with development of neck pain. The upper trapezius muscle helps with the function of neck rotation, side flexion and extension. Trapezitis involves myofascial pain syndrome which is characterized by trigger points. The syndrome is associated with tenderness in the muscle, spasm and restriction of range of motion [3]. Patient usually complains of pain, decreased cervical range of motion and difficulty in activities of daily living. Prevalence of myofascial syndrome is found to be 85%. Physiotherapy is the choice of treatment for trapezitis which includes

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stretching of the trapezius along with various electrotherapy modalities and active exercise therapy ^[1].

Active release technique (ART) is a method that focuses on relieving tension via the removal of adhesions which can develop in tissues as a result of overload due to repetitive use ^[1]. Active release technique has three objectives: Restoring free and unimpeded movement of soft tissue, the release of entrapped nerves, vasculature and lymphatics, Re-establish optimal texture, resilience and function of soft tissue ^[1]. The scar tissue adhesions are broken and spasm is relieved due to shortening and lengthening of muscle which leads to decrease in pain, improvement in mobility and neck function. Ischaemic pressure is a manual therapy technique which is frequently employed as a means of deactivating trigger point ^[2]. Ischemia means a lack of blood supply, with associated tissue irritation and congestion ^[2]. The purpose of deep ischaemic pressure is to deliberately increase blockage of blood to an area which upon release leads to hyperaemia. This washes away the waste products, supplies necessary oxygen and helps the tissue to heal

Need of Stud

Prevalence of neck pain is found to be 0.4-86.8% in young adults ^[7]. Individuals working at desks and computers for a long period of time are more prone for this condition as the upper trapezius muscle becomes painful and spasmodic. Poor ergonomic work habit such as prolonged constrained work position with lay neck or spine flexion may imply a risk factor. Maintaining poor posture for long periods of time can result in chronic muscular fatigue, discomfort or pain, even if the soft tissues are not structurally altered. More significantly prolonged exposure to high static muscle and joint may lead to pathological effects and permanent disability.

Limitation of range of motion along with neck pain and a feeling of stiffness may be experienced which is precipitated or aggravated by neck movements. Studies have been conducted to observe the effect of active release technique and deep ischaemic pressure on pain, cervical ROM and functional disability in upper trapezitis separately. But there is lack of research been done to compare the effects of both the techniques in upper trapezitis. Hence the purpose of this study is to compare the effect of active release technique and deep ischaemic pressure on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper trapezitis.

Aim

To study the effect of active release technique versus deep ischaemic pressure on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper trapezitis at the end of two weeks.

Objectives

1. To study the effect of active release technique on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper trapezitis at the end of two weeks
2. To study the effect of deep ischaemic pressure on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper trapezitis at the end of two weeks
3. To compare effect of active release technique and deep ischaemic pressure on pain, cervical lateral flexion and

functional disability in young adults with chronic bilateral upper trapezitis at the end of two weeks

Review of Literature

Daxa Mishra, R Harihara Prakash, Jigar Mehta, Ankita Dhaduk. Comparative study of active release technique and myofascial release technique in treatment of patients with upper trapezius spasm. Journal of clinical and diagnostic research, 2018, nov. To compare the effect of ART and MFR on the upper trapezius muscle spasm on pain and cervical range of motion. Although both techniques are effective in alleviation of symptoms and associated disability in upper trapezius muscle spasm, ART gave better result as compared to MFR.

Dr. kiran jeswani, snehal desai. To compare the effect of myofascial release and ischaemic pressure on pain, cervical lateral flexion and function in acute trapezitis in young adults. International journal of applied research 2018, feb. 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.

Dr. divya khare, Rushali Pathak. Effectiveness of elastic resistance band exercises versus conventional exercises on cases of trapezitis: A comparative study. International journal of orthopaedics sciences: 2018. To find out the effectiveness of elastic resistance band exercises versus conventional exercises on cases of trapezitis. The study is believed to draw attention to the importance of exercises in trapezitis and to contribute to formation of clinical guidelines in the future and further researchers on similar protocols with varied parameters

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Gillian A. Hawker, samra mian, tetyana kendzerska, Melissa French. Measures of adult pain: Visual analog scale for pain (VAS pain), Numeric rating scale for pain (NRS pain), McGill pain questionnaire (MPQ), Short-form McGill pain questionnaire (SF-MPQ), Chronic pain grade scale (CRGS),

Short form-36 bodily pain scale (SF-36 BPS), and Measure of Intermittent and Constant Osteoarthritis Pain (ICOAP). Arthritis care & research. 2011 Nov 1($r=0.94$)
 Vernon H, Mior S. The Neck Disability Index: A study of reliability and validity. Journal of Manipulative and Physiological Therapeutics. 1991($r=0.89$)

Methodology

Study type: Comparative study
 Study design: Pre and post experimental study
 Sample size: 40
 Sampling method: Convenient sampling
 Study population: Young adults with chronic bilateral upper trapezitis within 18-30 years of age
 Study setting: OPD in and around city
 Treatment duration: 2 weeks for alternate days per week

Criteria

Inclusion

- Age: 18-30 years
- Both males and females
- Chronic trapezitis (pain lasting for more than 3 months)
- Bilateral trapezitis
- VAS scores ranging from 4cm-7cm
- Cervical lateral flexion less than 45 degrees
- Young adults diagnosed with chronic bilateral upper trapezitis

Exclusion

- Traumatic neck injury within past 1 year
- Fracture of cervical vertebrae within past 1 year
- Cervical radiculopathy
- Cervical disc pathology
- Cervical instability and any degenerative condition of the cervical spine
- Skin disease and infection
- Recent surgery in and around shoulder and cervical region within past 1 year
- Congenital cervical abnormalities
- People on analgesics and pain killer

Diagnostic Criteria for Trapezitis

By Goniometry And Palpatory Method

1. Taut band within upper trapezius muscle^[6]
2. Exquisite tenderness at a point on the taut band^[6]
3. Pain on palpation by the examiner^[6]
4. Restricted in cervical lateral flexion range of motion^[6]
5. Referred pain sensation on compression of the taut band^[6]

Materials and Tools

Stool, Pen, Paper, Consent form
 Visual analogue scale ($r=0.94$)^[9]
 Universal Goniometer($r=0.98$)
 Neck disability index (NDI) ($r=0.89$)^[10]

Outcome Measures

Visual Analogue Scale

Patient will be asked to rate pain intensity by placing a mark on 10cm VAS.

The VAS is horizontally positioned with the extremes labeled as "least possible pain" and "worst possible pain". A higher score indicates greater pain intensity and lower score indicates lower pain intensity
 VAS score: 1-3cm-mild pain

4-7cm- moderate pain
 8-10cm- severe pain

Goniometer

Goniometry refers to measurement of angles created at human joints by bones of the body.

Measurements are obtained by placing parts of measuring instruments, called goniometer. Along the bones immediately proximal and distal to joint being evaluated.

Universal Goniometer is the most common tool used in clinical settings for evaluation of joints as it is reliable, easy to use and cost effective.

Neck Disability Index: Neck disability index consist of 10 sections that are designed to enable the patient to understand how much the neck pain has affected their ability to everyday activities. Each section is scored on a 0 to 5 rating scale. The test can be interpreted with a maximum score of 50. A highest score indicates more patient rated disability.

0-4 points indicates no disability

5-14 points indicates mild disability

15-24 points indicates moderate disability

25-34 points indicates severe disability

35-50 points indicates complete disability

Procedure

Study began with presentation of synopsis to an ethical committee and ethical clearance was taken from P.E.S. Modern College of Physiotherapy. Detailed instructions was given to the subjects regarding the study and written consent was taken from the subjects who were willing to participate. Subjects were selected according to the inclusion and exclusion criteria.

Subjects were divided into 2 groups (15 in each group) by Random Allocation with chit method. Both the groups were explained about the procedure. Pre-intervention assessment of neck pain, cervical lateral flexion ROM and functional disability was taken. Group A received active release technique along with conventional physiotherapy. Group B received ischaemic pressure along with conventional physiotherapy. Both the groups received treatment for alternate days for 2 weeks. Total 7 sessions for 2 weeks and duration of each session was given for 20-30 minutes. Post-intervention assessment of neck pain, cervical lateral flexion ROM and functional disability was taken at the end of two weeks.

Conventional Treatment

Stretching of upper trapezius: Patient was seated on a chair. Instruct to grasp base of the chair with hand of the side at which the stretch was targeted. Head was rotated to the side of anchored arm. Place other hand on the head, tilt the head sideways and apply pressure in the same direction until a stretch is felt on the opposite upper trapezius and hold for 30sec.

Repeat: 3 times/set

Active range of motion exercises: Cervical lateral flexion, rotation, extension and flexion

Repeat: 1 set of 10 repetitions

Group A: Active release technique

For application of ART: Patient position: sitting on a stool with forearm flexed and hand supported on the thighs.

Therapist position: standing behind the patient with one hand stabilizing the shoulder. Starting position: Neck was taken actively into extension, same side lateral flexion and opposite side rotation (shortened position). Contact was made using thumb with the upper trapezius muscle over the trigger point and deep tension stretch was applied. End position: Neck was taken actively in to flexion, opposite side lateral flexion and same side rotation (lengthened position). 3-5 repetitions were given.

Group B: Deep Ischaemic Pressure

For application of ischaemic pressure subjects were positioned in a forward lean position with pillow to relax the target muscle. Sustained deep pressure with the thumb to the upper trapezius trigger point for 30 seconds to 1 minute was applied. Pressure was released when there was decreased tension in the trigger point or when the trigger point was no longer tender or one minute was elapsed, whichever occurs first. The procedure was repeated for 3-5 times with rest interval for 1 minute

Data Analysis

- Improvement in pain, cervical lateral flexion and functional disability was assessed by VAS, Goniometry and Neck Disability Index respectively
- The data was entered in Excel spread sheet, tabulated and subjected to Statistical Analysis.
- The data was entered and analyzed using Primer of Biostatistics version 7.0 checking effectiveness of active release technique versus deep ischaemic pressure in young adults with chronic bilateral upper trapezitis at the end of two weeks
- PRE and POST data analysis for VAS, Cervical lateral flexion (goniometry) and functional disability (neck disability index) was done by paired t-test for both the groups
- Group A and Group B inter group analysis for VAS, Cervical lateral flexion (goniometry) was done using unpaired t-test and for NDI inter group analysis the Mann-Whitney U test was done

Statistical Analysis

Table 1: Effect of Active Release Technique on Pain (Group A)

Right	Pre	Post	Left	Pre	Post
MEAN	5.585	3.43	MEAN	5.495	3.23
SD	0.735	0.8652	SD	0.8198	0.6157
p value	<0.0001		p value	<0.0001	
t value	27.063		t value	18.485	

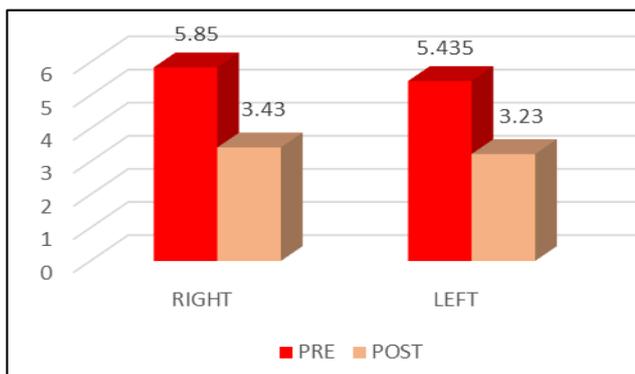


Fig 1: Vas [GROUP A]

Table 2: Effect of Active Release Technique on Cervical Lateral Flexion (Group A)

Right	Pre	Post	Left	Pre	Post
Mean	23.15	33.3	MEAN	23.65	33.6
SD	5.008	4.813	SD	5.393	4.817
p value	<0.0001		p value	<0.0001	
t value	-41.666		t value	-26.166	

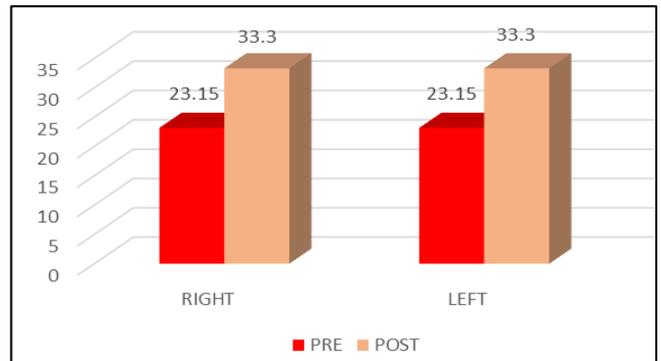


Fig 2: Cervical Lateral Flexion [GROUP A]

Table 3: Effect of Active Release Technique on Neck Disability Index (Group A)

	Pre	Post
Mean	9.75	5
p value	<0.0001	
Z sub W	3.99	

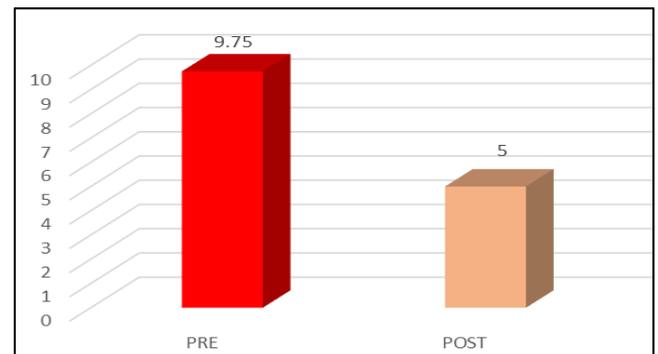


Fig 3: Neck Disability Index [GROUP A]

Table 4: Effect of Deep Ischaemic Pressure on Pain (Group B)

Right	Pre	Post	Left	Pre	Post
MEAN	5.185	4.275	MEAN	4.865	3.88
SD	0.6953	0.6995	SD	0.7169	0.7172
p value	<0.0001		p value	<0.0001	
t value	19.151		t value	14.878	

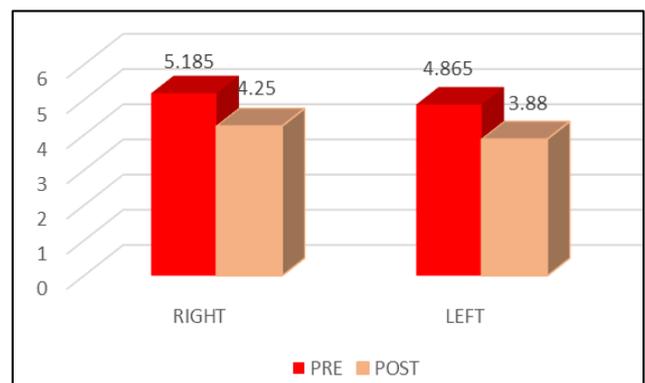


Fig 4: VAS [GROUP B]

Table 5: Effect of Deep Ischaemic Pressure on Cervical Lateral Flexion (Group B)

Right	Pre	Post	Left	Pre	Post
MEAN	23.1	27	MEAN	22.95	26.7
SD	4.166	4.437	SD	4.673	4.45
p value	<0.0001		p value	<0.0001	
t value	-24.285		t value	-23.411	

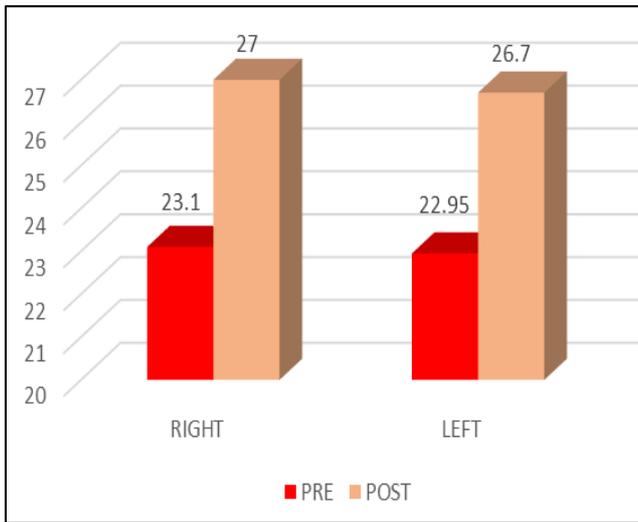


Fig 5: Cervical Lateral Flexion [GROUP B]

Table 6: Effect of Deep Ischaemic Pressure on Neck Disability Index (Group B)

	PRE	POST
MEAN	9.3	5.95
p value	<0.0001	
z sub W	3.99	

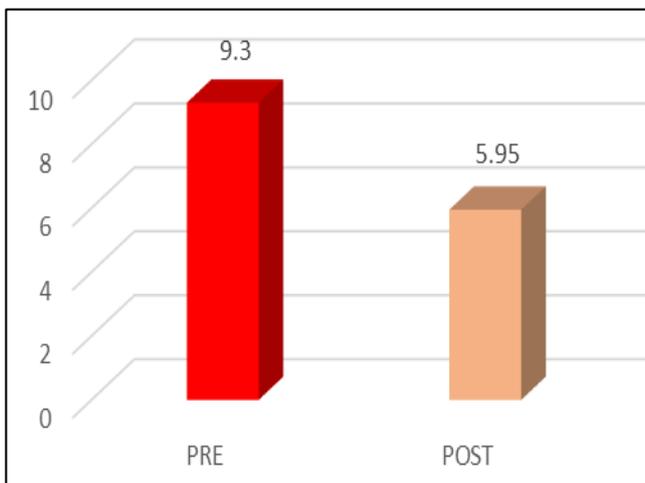


Fig 6: Neck Disability Index [GROUP B]

Table 7: Inter Group Comparison for Pain

Right	Group A	Group B	Left	Group A	Group B
MEAN	3.43	4.275	MEAN	3.23	3.88
SD	0.2125	0.4384	SD	0.3069	0.5444
p value	<0.0001		p value	<0.0001	
t value	11.89		t value	9.123	

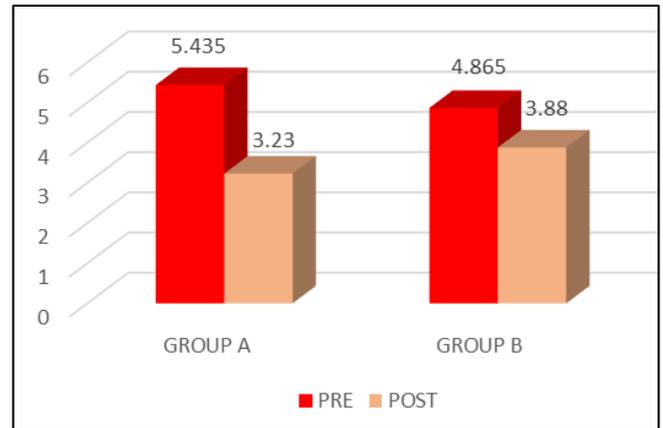


Fig 7: Inter Group Comparison Vas [Left]

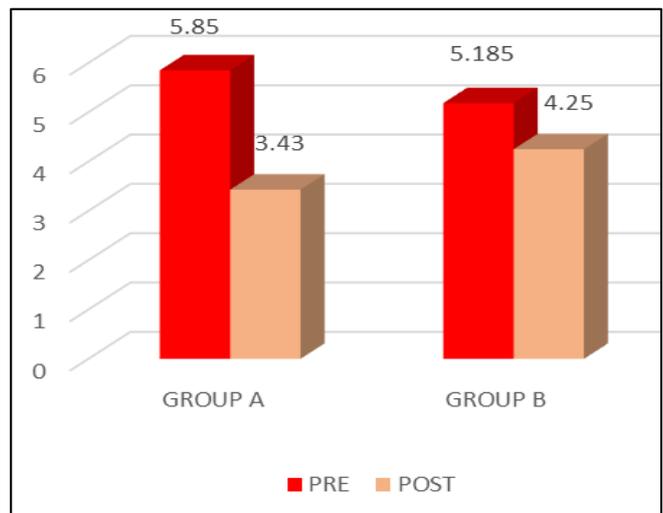


Fig 8: Inter Group Comparison Vas [Right]

Table 8: Inter Group Comparison for Cervical Lateral Flexion

Right	Group A	Group B	Left	Group A	Group B
MEAN	10.15	3.9	MEAN	9.95	3.75
SD	0.7182	1.089	SD	1.701	0.7164
p value	<0.0001		p value	<0.0001	
t value	21.421		t value	15.026	

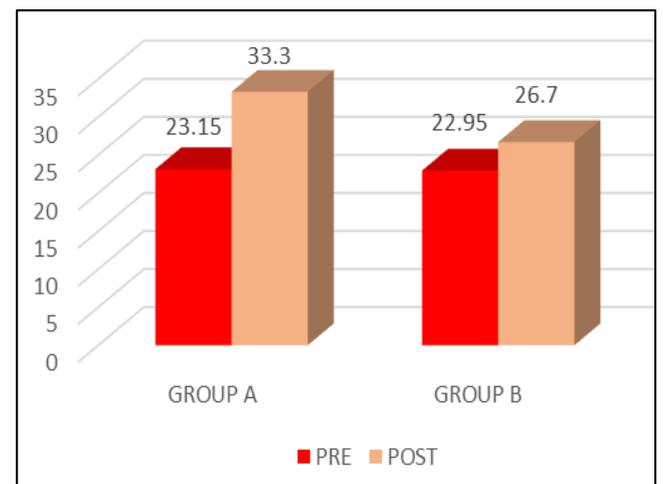


Fig 9: Inter Group Comparison Cervical Lateral Flexion [Left]

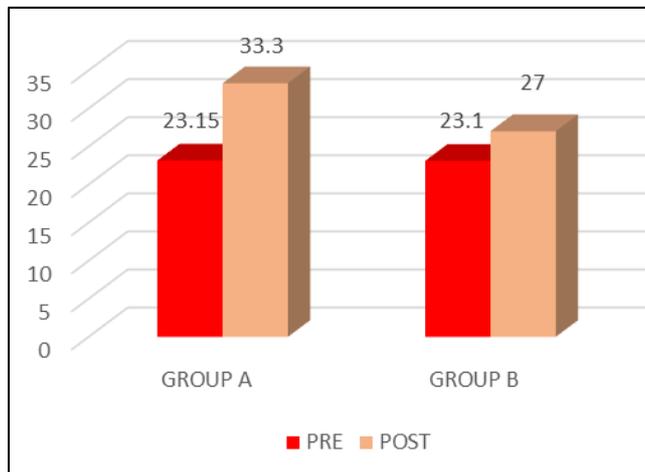


Fig 10: Inter Group Comparison Cervical Lateral Flexion [Right]

Table 9: Inter Group Comparison for Neck Disability Index

	Group A	Group B
MEAN	5	5.95
p value	<0.0001	
Z sub T	3.669	

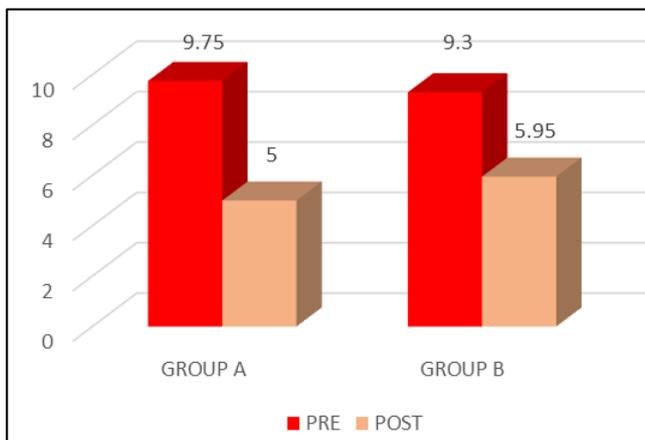


Fig 11: Inter Group Comparison for NDI

Results

Vas Score

Mean values for VAS Score Group A (Right) were 3.43±0.21 and for Group B (Right) were 4.27±0.43

Mean values for VAS Score Group A (Left) were 3.23±0.30 and for Group B (Left) were 3.88±0.54

Unpaired t test was used to compare effectiveness in both the groups

The ‘t’ value (Right) obtained was 11.89 and p value was <0.0001 (extremely significant) and ‘t’ value (left) obtained was 9.12 and p value was <0.0001 (extremely significant)

Cervical Lateral Flexion

Mean values for cervical lateral flexion Group A (Right) were 10.15±0.71 and for Group B (Right) were 3.9±1.0

Mean values for cervical lateral flexion Group A (Left) were 9.95±1.7 and for Group B (Left) were 3.75±0.71

Unpaired t test was used to compare effectiveness in both the groups

The ‘t’ value (Right) obtained was 21.42 and p value was <0.0001 (extremely significant) and ‘t’ value (left) obtained was 15.02 and p value was <0.0001 (extremely significant)

NDI Scores

Mean values for NDI scores were 4.75 and 3.35 for Group A and Group B respectively

Mann Whitney U Test was used to compare effectiveness in both the groups

The p value was <0.0001 which is considered extremely significant

Discussion

The objective of this study was to compare the effects of active release technique with deep ischaemic pressure on pain, cervical lateral flexion and functional disability in young adults with chronic bilateral upper trapezitis. Trapezitis is an inflammatory pain arising from trapezius muscle. Trapezitis involves myofascial pain syndrome which is characterized by trigger points. The syndrome is associated with tenderness in the muscle, muscle spasm and limitation of ROM.

The study included 40 subjects within age group of 18-30 years of age the mean age being 22.3±2.1 years for group A and 22.5±1.5 years for group B. The number of female subjects were more than males. The gender distribution in each group was such that group A consisted of 15 females and 5 males and group B consisted of 14 females and 6 males. Both the treatments were given along with conventional therapy which consisted of stretching for upper trapezius and active cervical range of motion exercises. Treatment duration was 2 weeks which included 7 treatment sessions.

Pre and post data analysis in group A (ART) was analysed by paired t test within the group for VAS and goniometry and Wilcoxon signed rank test for NDI which revealed significant reduction in pain, increase in cervical lateral flexion and improvement in neck functions on NDI.

Daxa Mishra, R Harihara Prakash (2018) in their study stated that ART was effective in alleviation of symptoms that is pain, improvement in cervical lateral flexion and associated disability in upper trapezitis. The possible mechanism behind the result may be mechanical stimulation causes a reactive hyperaemia and produces analgesic effect. Mechanical stimulation through digital pressure invokes the physiological response to cutaneous as well as muscular mechano receptors. This may alter nociception and pain. Patient also actively involves himself in movement as a result tissue adhesions are broken and spasm is relieved due to shortening and lengthening of muscle which leads to improvement in cervical lateral flexion as well as neck function.

Pre and post data analysis in group B (DIP) was analysed by paired t test within the group for VAS and goniometry and Wilcoxon signed rank test for NDI which revealed significant reduction in pain, increase in cervical lateral flexion and improvement in neck functions on NDI.

Snehal Desai (2018) [3] in their study stated the effectiveness of DIP in improving pain, cervical lateral flexion and neck disability in acute trapezitis in young adults. Deep ischaemic pressure is effective in reduction of pain as it deliberately increases 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. Deep ischaemic pressure was followed by lengthening of the muscle thus improving cervical lateral flexion as well as neck function.

The inter group analysis was done using unpaired t45 test for VAS and Goniometry, Mann Whitney U test for NDI which revealed that both the treatment were individually effective in reduction of pain, improving cervical lateral flexion and reduction of NDI score

Conclusion

According to the results it is proved that Active Release Technique and Deep Ischaemic pressure both are effective in treating chronic bilateral upper trapezitis in young adults. But this study concludes that Active Release Technique is more effective than deep ischaemic pressure on pain, cervical lateral flexion and neck disability in chronic bilateral upper trapezitis in young adults.

Limitations

The study was conducted on a small population. Lack of sensitivity of NDI such as lifting, driving and recreation did not apply on all participants tested. The follow up after two weeks was not monitored to see the sustained effect of therapy

Future Scope

The study can include other age groups It can be further studied on a larger population Study can be specified on a particular population showing significant prevalence of trapezitis example individuals working in corporate sector

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