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## To compare the effectiveness of mofascial release (MFR) versus instrument assisted soft tissue mobilization (IASTM) with M2T blade technique on pain and disability in chronic upper trapezitis at the end of 6 weeks

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### Abstract

**Objective:** A study to compare effect of Myofascial Release (MFR) versus Instrument Assisted Soft Tissue Mobilization (IASTM) on pain and disability in patients with chronic upper trapezitis.

**Background:** The upper trapezius is designated as postural muscle and it is highly susceptible to overuse. Trapezitis is an inflammation of the trapezius muscle and is the most commonly seen condition in clinical practice. Patients experience pain that limits their daily activities. Myofascial release (MFR) is a form of manual therapy that involves the application of a low load, long duration stretch. Instrument Assisted Soft Tissue Mobilization or IASTM technique includes the use of a tool to treat soft tissue dysfunction.

**Outcome Measure:** Visual Analogue Scale (VAS), Neck Disability Index (NDI)

**Method:** The study included 30 subjects having upper trapezitis with 15 subjects in each group. Group A received Myofascial Release and Group B received Instrument Assisted Soft Tissue Mobilization (IASTM) with M2T blade for 18 sessions over a period of 6 weeks.

**Result:** Inter group analysis for VAS in Group A and B with mean values  $3.014 \pm 0.9937$  and  $3.773 \pm 0.6419$ ,  $p=0.02$ . Inter group analysis for NDI in Group A and B with mean  $10.37 \pm 3.942$  and  $13.59 \pm 5.247$ ,  $p=0.089$ .

**Conclusion:** The study showed significant result in reducing pain and improvement in disability in both the groups. Inter group comparison showed Instrument Assisted Soft Tissue Mobilization technique is more effective in the long term, to reduce pain in chronic upper trapezitis patients whereas for improving disability, Myofascial Release and Instrument Assisted Soft Tissue Mobilization are equally effective.

**Keywords:** Trapezitis, MFR, IASTM, M2T, pain, disability

### 1. Introduction

Fascia is a viscoelastic tissue which envelops muscles, bones and organs and is a continuous network throughout the body. Mechanical force transmission is the main role of the fascia. It changes from viscous gel state to less viscous sol state<sup>[4]</sup> particularly the application of heat, active or passive movement and soft tissue manipulation<sup>[5]</sup> Trapezitis is defined as an inflammation of trapezius muscle. The upper trapezius is designated as postural muscle and it is highly susceptible to overuse<sup>[6]</sup> Low level activity of the upper trapezius is frequently found during sitting and standing which is related to head posture and is a common source of tension and neck pain in people who work at a desk and computers or who spend many hours driving<sup>[7]</sup> Neck pain is very common in the region of the upper trapezius muscle. Working postures with the neck in extreme flexion increase the load moment three to four times causing spasm of the neck muscles. Also working tasks that involve continuous arm movements always generate a static load component on these muscles<sup>[25]</sup> and cause muscle spasm.

Myofascial release (MFR) is a form of manual therapy that involves the application of a low load, long duration stretch to the myofascial complex, intended to restore optimal length, decrease pain, and improve function<sup>[26]</sup> By MFR there is a change in the viscosity of the ground substance (the fascia) to a more fluid state which eliminates the fascia's excessive

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pressure on the pain sensitive structure and restores proper alignment. This technique acts as a catalyst in the reduction of trapezius spasm<sup>[27]</sup>

Instrument Assisted Soft Tissue Mobilization or IASTM technique includes the use of a tool to treat soft tissue dysfunction. It is performed with ergonomically designed instruments that detect and treat fascial restrictions M2T Blade (Canada) is a latest invention in instrument assisted soft tissue mobilization (IASTM) technique used for myofascial release and helps to relieve myofascial pain.

## 2. Methodology

Study design: Pre and post comparative study.

Sample size: 30

Sampling method: Simple random sampling.

Study population: Adults in the age group 18-30 years diagnosed with chronic upper trapezius.

Sample size: 30

Study duration: 6 weeks. 3 times a week.

## 3. Inclusion Criteria

- Adults of ages 18-30 diagnosed with chronic trapezius.
- Condition present for more than 3 months.
- Both males and females.
- Visual Analogue Scale score between 3 and 7.

## 4. Exclusion Criteria

- Referred pain due to cervical pathology
- Healing fractures over neck and upper back region
- Dermatitis over upper back
- Clotting disorders
- Hypersensitive skin.
- Wound over neck region
- Shoulder pathology

## 5. Outcome Measures

- **Visual Analogue Scale:** Pain intensity can be measured by means of visual analogue scale (VAS). A 10 cm line marked with number 0-10 can be used where 0 symbolizes no pain and 10 is maximum pain. Subject is asked to mark his / her pain on this line as per the severity<sup>[35]</sup> Visual Analog Scale will be used to measure the pain in the subject's pre- treatment and post treatment as VAS is more reliable for pain evaluation<sup>[36, 37]</sup>
- **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<sup>[38]</sup>

## 6. Sampling and Study Design

Subjects were divided into 2 groups A and B by chit method.

Group A received Myofascial Release technique treatment while Group B received Instrument Assisted Soft Tissue Mobilization with M2T blade treatment.

## 7. Procedure

Presentation of synopsis to an ethical committee and approval was taken from the ethical committee was taken.

Subjects were selected on the basis of the inclusion and exclusion criteria

Subjects were explained about study and consent was taken.

All Samples were asked to mark VAS and NDI scores pre treatment.

Treatment time was of total 5 minutes for both the groups.

Duration of protocol was of 6 weeks with treatment given 3 days/week i.e. 18 sessions in total.

Position of the patient – sitting position, elbow flexed with forearm placed on a pillow

Therapist position – standing behind patient.

### Group A: Myofascial Release Technique.

**Step 1:** Light stroking- Emollient will be applied on the part being treated.

**Step 2:** Medium stroking- Stroking movement over the upper trapezius muscle fibres. Increase pressure with each movement as the tissue warms.

**Step 3:** Firm Pressure- Ask patient to laterally flex the neck and apply firm pressure through medial border of the index finger but maintain contact of whole palmar surface. This will be followed by firm pressure given by inter-digit space.

**Step 4:** Kneading- Finger and Thumb used to squeeze the fibres and allow skin to slide from grasp.

**Step 5:** Firm pressure, Medium stroking and Light stroking done with decreasing pressure on the part.

### Group B: Instrument Assisted Soft Tissue Mobilization Technique.

**Step 1:** Emollient will be applied to the part either by hand/instrument.

**Step 2:** 1 min of sweeping the upper trapezius region. Sweeping is a longitudinal stroke performed parallel to the muscle fibers.

**Step 3:** 1 min of swiveling directly over the MTrP (if present). Swiveling is a technique in which the pointer side of the instrument is placed directly on the MTrP and pivoted/ rotated back and forth.

-If MTrP absent, scraping done throughout the muscle length, parallel to muscle fibres.

Scraping is a technique in which with the long edges, short strokes are given in a progressive manner.

**Step 4:** 2-min of fanning the part in all directions. Fanning is a stroke in which one end of the instrument is held in place and the other end is moved in a circular pattern in the shape of a fan

**Step 5:** 1-min of sweeping over the upper trapezius

## 8. Data and Statistical Analysis

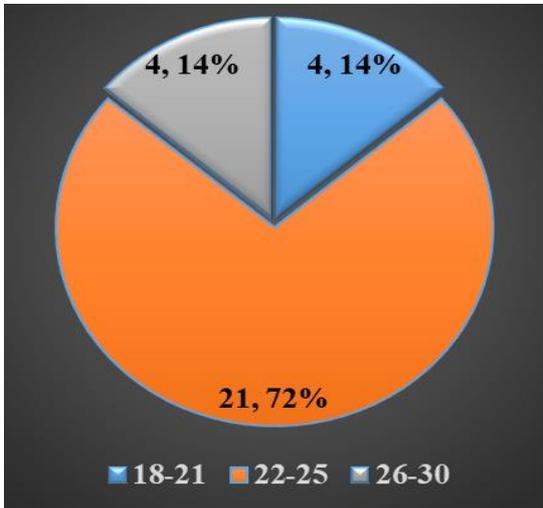
- The data was entered in Excel sheet, tabulated and subjected to Statistical Analysis.
- Data entered was analyzed with the help of Primer of Biostatistics (version 7).
- Reduction in pain and disability were analyzed using paired t-test for intra group and unpaired t-test for inter group analysis for Visual Analogue Scale (VAS).

Wilcoxon rank test for intra group and Mann-Whitney U test for inter group analysis for Neck Disability Index (NDI).

- The data passed the normality test when analyzed.

**Table 1:** Age Wise Distribution of Demographic Data

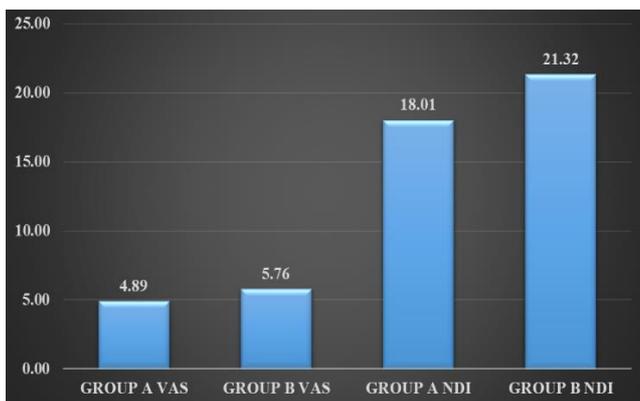
Age Groups	No.
18-21	4
22-25	21
26-30	4



Age Distribution

**Table 2:** Baseline Data Analysis: Group A and Group B Visual Analogue Scale and Neck Disability Index

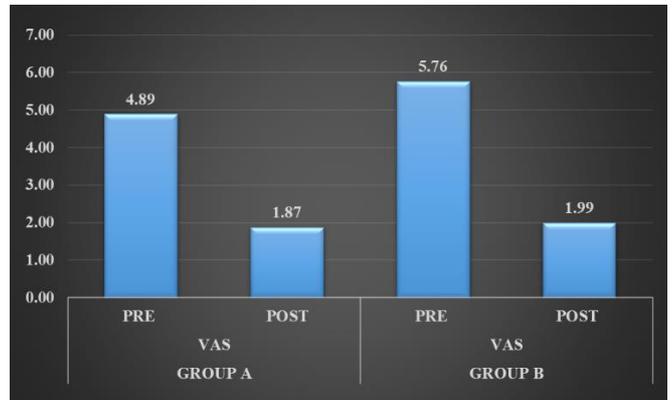
Baseline Data Analysis- Group A And Group B Vas And NDI			
Group A VAS	Group B VAS	Group A NDI	Group B NDI
4.89	5.76	18.01	21.32



Baseline Data Analysis- VAS and NDI

**Table 3:** Intra Group A and B Vas Analysis

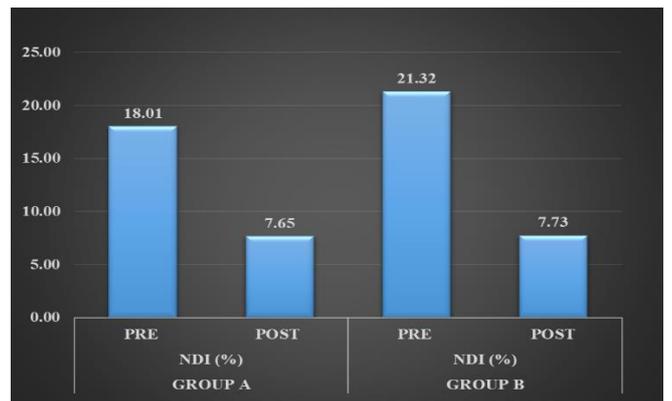
	Visual Analogue Scale	
	Group A	Group B
Mean Pre Vas	4.89	5.76
SD	0.8151	0.9701
Mean Post Vas	1.87	1.99
SD	0.4874	0.4955
T Value	11.35	22.77
P Value	0.000	0.000
Result	Significant	Significant



Group A and B Vas Analysis

**Table 4:** Intra Group A and B NDI Analysis

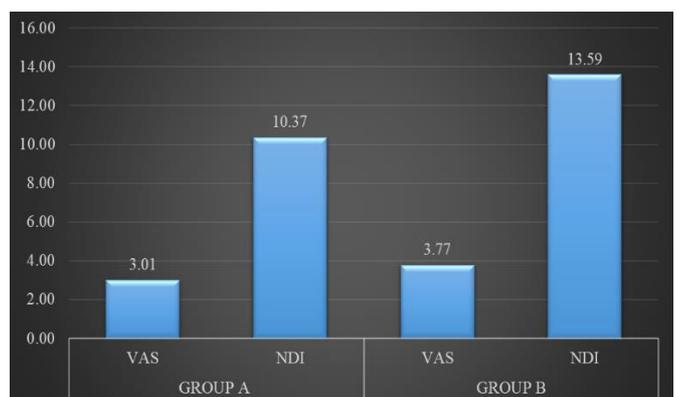
	Neck Disability Index	
	Group A	Group B
Mean Pre NDI	18.01	21.32
Sd	4.432	6.273
Mean Post NDI	7.65	7.73
Sd	2.439	3.517
P Value	0.001	0.00
Z Sub W	3.289	3.398
Result	Significant	Significant



Group A and B NDI Analysis

**Table 5:** Inter Group A Vs B Vas and NDI Analysis

		Inter Group Analysis			
		MEAN	SD	P value	T value
VAS	Group A	3.014	0.9937	0.021	-2.461
	Group B	3.773	0.6419		
NDI	Group A	10.37	3.942	0.089	Z sub T 1.702
	Group B	13.59	5.247		



Group A Vs B Vas and NDI Analysis

## 9. Result

- The intra group analysis between the values obtained on VAS in both the groups shows a significant reduction in means of VAS values ( $4.89 \pm 0.8151$  to  $1.87 \pm 0.4874$  in group A,  $p=0.00$  and  $5.76 \pm 0.9701$  to  $1.99 \pm 0.4955$  in group B,  $p=0.00$ )
- The comparison between the mean values of the difference between the results of VAS in group A ( $3.014 \pm 0.9937$ ) and B ( $3.773 \pm 0.6419$ ),  $p= 0.02$ , indicate more improvement in Group B than in Group A.
- The intra group analysis between the NDI values in both the groups show a significant reduction in means of NDI values ( $18.01 \pm 4.432$  to  $7.65 \pm 2.439$  in Group A,  $p=0.001$  and  $21.32 \pm 6.273$  to  $7.73 \pm 3.517$  in Group B,  $p=0.00$ )
- The comparison between mean values of difference between results of NDI values of Group A ( $10.37 \pm 3.942$ ) and Group B ( $13.59 \pm 5.247$ ),  $p= 0.089$ , statistically proves the null hypothesis indicating Group A=Group B for improving functional disability.

## 10. Discussion

In this study we compared the effectiveness of myofascial release (MFR) versus instrument assisted soft tissue mobilization (IASTM) with m2t blade technique on pain and disability in chronic upper trapezitis at the end of 6 weeks in adults between age groups 18-30 years. After completion, post scores for VAS and NDI were marked. Samples in Group A experienced soreness, redness and slight discomfort. Group A had 1 dropout due to excessively increased pain on the next day after the first treatment.

Inter group analysis for pain (VAS) in Group A and B with Unpaired t-test showed a statistical significant result with the IASTM technique being relatively superior ( $p=0.02$ ), than MFR.

Although, inter group analysis for disability in Group A and B showed statistical insignificance ( $p=0.089$ ). This could be due to the non-restrictive stressful activities continued to perform during the protocol duration.

MFR and IASTM being alternatives for facial release, act closely with respect to their mechanisms, having a few advantages and disadvantages over the other.

MFR being a hands-on technique, has proven to increase tissue temperature more than that in IASTM. It provides hands-on stimulation to the shortened fascia around the contracted muscle through receptors providing an afferent stimulation to cause efferent relaxation by stretch provided to the fascia, decreasing the viscosity of the fascial layer underneath.

But due to the friction caused by the hands, vasomotor response causes redness and the stretching results in soreness on the treatment area. Also, the perception of increased blood flow due to the risen temperature may cause throbbing sensation leading to discomfort.

In IASTM technique, healing process is initiated by releasing the adhesions and increasing the blood supply to the treatment area by the increased temperature, due to the microvascular and capillary hemorrhage caused due to the shear force acting on the soft tissue by the tool, promoting realignment and increase in tissue and fascial flexibility and mobility.

The stainless steel tool provides a gliding effect, reducing the friction caused on the soft tissue. It also provides

mechanical advantage to the therapist to avoid overuse of hands and treat with controlled mechanical force application. Beveled edges and treatment borders help to easily localize the treatment area.

## 11. Conclusion

This study concludes that Instrument Assisted Soft Tissue Mobilization technique is more effective in the long term to reduce pain in chronic Upper Trapezitis patients whereas for improving disability, Myofascial Release and Instrument Assisted Soft Tissue Mobilization are equally effective.

## 12. Limitations

- Absence of strengthening protocol
- Absence of follow up after duration of the study ended
- The study was conducted on small population of 30 samples
- Range of motion was not included in the outcome measures to verify results.

## 13. Future scope of Study

- It can be further studied on a larger population
- Study can be specified on a particular population having higher significant prevalence of trapezitis
- Technique can be given with prior hot pack application and strengthening protocol along with IASTM.

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