



# A Study to Compare the Effect of Instrument Assisted Soft Tissue Mobilization (IASTM) And Active Release Technique (ART) For Upper-Trapezius Trigger-Points Pain.

Dr. Himanshi Ruparelia (PT)

Assistant Professor, Department of Physiotherapy Marwadi University

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## KEYWORDS

Trapezititis,  
IASTM, ART,  
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## ABSTRACT:

**Introduction:** The upper trapezius is designated as a postural muscle and it is highly susceptible to overuse. Trapezitis is mainly caused due to stress and tension, repetitive movements, poor posture, prolonged head bending activity, using a thick pillow, tight pectoral major muscle, and severe neck spasms. Active Release Technique (ART) is based on the theory of cumulative trauma disorder (CTD). The Active release technique aims to return complete translation or relative motion to the full length of the affected soft tissue and its adjacent soft-tissue structures. IASTM is a skilled myofascial intervention thought to be based upon the rationale by James Cyriax. IASTM is applied using specially designed instruments to provide a soft-tissue mobilization.

**Method:** 30 subjects who fulfilled the selection criteria, were selected and randomly allocated to either Group A–IASTM or Group B–ART. Each intervention was given for 5 days following which post-data was taken. Outcome measures–NPRS and Contralateral side-flexion range of motion.

**Result:** It shows a significant difference within the group but there is no significant difference between groups.

**Conclusion:** The study concludes that there is a significant improvement in outcome measures among both the groups. And both techniques are equally effective for decreasing cervical pain and improving ROM. Hence any treatment can be preferred when patients with similar conditions present at the clinic.

## 1. Introduction

Musculoskeletal pain occurs due to repetitive strain injuries. When a person overexerts with high-intensity exercise or long periods of exercise in poor posture, the soft tissue structures such as muscles, ligaments and tendons are more prone to injuries. <sup>[1]</sup> Trapezitis is defined as an inflammation of the trapezius muscle. The upper trapezius is designated as a postural muscle and it is highly susceptible to overuse. Trapezitis is an inflammatory pain arising from the trapezius muscle causing a severe neck spasm. This muscle lies at the back of the neck and helps in shrugging movement of the shoulders along with upward movement of the head. <sup>[2]</sup> Bad posture while working with a computer leads to

rounded shoulders and forward head posture (FHP). If this position presents for a long term, then low-intensity stimulus for the upper trapezius muscle will lead to the formation of the spasm–pain–spasm cycle, which, due to the decreased blood and oxygen supply and nutrients to the muscle, eventually leads to the formation of myofascial trigger points (MTrPs) in the muscles (Clark et al., 2012; Muñoz-Muñoz et al., 2012; Kelencz et al., 2011; de-Las-Penas et al., 2007; Yap 2007; Richards, 2006). Manual therapies are commonly used in the treatment of chronic neck pain, and there are numerous systematic here are numerous systematic reviews of the treatment of neck pain by manual therapy <sup>[4]</sup>. Pain is classified into three categories based on the duration of



onset – Acute, Subacute, and chronic. When pain persists for more than 3 months it is classified as Chronic pain <sup>[5]</sup>. The trapezius is the most frequently involved muscle in developing Myofascial trigger points. It has been estimated that 85% of people who come to pain clinics have trigger points in the neck. <sup>[6]</sup> Myofascial pain syndrome is chronic pain caused by trigger points <sup>[6]</sup>. A trigger point is associated with musculoskeletal problems (muscle spasm, restricted range of motion (ROM), and decreased fibre extensibility) and autonomic symptoms that affect the patient's physical abilities. <sup>[7]</sup> Myofascial trigger points may develop in either tight or loose structures, but usually appear more frequently and are more stressed in those which are tethered, restricted, or tight. Myofascial trigger points will continue to evolve if the aetiological factors are not corrected and, unless the trigger points are released, they will sustain the dysfunctional postural patterns which subsequently emerge. <sup>[8]</sup> Trigger points are areas that are palpably painful, tender, sensitive, localized and when pressed, will transmit or activate pain (and other) sensations some distance away from themselves, in 'target' tissues. <sup>[8]</sup>

IASTM is the use of a specially designed instrument to mobilise soft tissue, with the aim to reduce pain and to improve ROM and function. IASTM minimises stress on the practitioner's hand and enables greater penetration to better access fascia and release restrictions <sup>[9]</sup> IASTM techniques use special stainless-steel instruments that enable clinicians to locate efficiently and treat soft tissue dysfunction. It enables clinicians to locate efficiently and treat soft tissue dysfunctions, such as fibrosis, adhesions, chronic inflammation, or degeneration. According to Fousekis K et al IASTM has shown as an effective treatment measure for relieving trigger points. <sup>[10]</sup>

Active release technique (ART) is a manual therapy for treating soft tissue problems in muscles, joints, and connective tissue <sup>[11]</sup> It is a non-invasive treatment of soft tissue that locates and breaks down the adhesions that cause discomfort, stiffness, fatigue, numbness and physical dysfunction <sup>[12]</sup>. Active Release Technique is based on the theory of cumulative trauma disorder (CTD). CTD is a soft tissue injury that results from acute injury, repetitive injury, or a constant pressure/tension injury. CTD starts with weak and tight tissues that are thought to produce an increase in internal forces acting on the tissues, such as friction, pressure, or tension. <sup>[13]</sup> The initiating event in the development of CTD involves

abnormal posturing of the head and neck or upper extremity such that a position is maintained or repeated over a prolonged period of time. <sup>[14]</sup>

For assessing pain in the current study NPRS was used which is outcome measure along with the lateral flexion ROM measured by universal goniometer.

## 2. Objectives

The objective of the current study was to identify the better treatment for the trapezitis between IASTM and ART.

## 3. Methods

A study was conducted including 30 subjects with pain in upper trapezius unilaterally or bilaterally. Inclusion criteria were Age – between 18-22 years, an individual having pain present in the upper trapezius and trigger points in the upper trapezius, an individual having pain for more than 3 months, individual who is willing to take part in the study. Exclusion criteria were – Individual with any neurological problems related to the cervical spine e.g., Cervical Radiculopathy, Individual with trauma and surgery around the neck and shoulder in the past one-year, cervical myelopathy, congenital anomalies like torticollis etc., motor weakness of upper limb and fibromyalgia.

After the screening process, the procedure was explained to the participants and written consent was taken from them. Pre-measurement of all outcome measures was taken then the patient was randomly divided into either of the two groups: Group A – IASTM and Group B – ART.

### Group A – IASTM

For IASTM individual was sitting in a comfortable position head resting on a pillow. By using the Edge tool instrument IASTM was given. At the beginning of the session, the instrument was properly cleaned maintaining aseptic precautions following that a lubricant was applied over the upper trapezius where IASTM was to be given. Then by using, the blade area of restriction was identified and treatment was given maintaining the 45° angle with the skin and performing slow strokes along the muscle fibres from its origin to insertion using the fanning technique this was repeated for about 3 minutes. During this procedure, no discomfort occurred to the subject. <sup>[1,6]</sup>



## Group B – ART

For the active release technique, an individual sits comfortably on the chair leaning backward both hands were placed on the knees. The trigger point was trapped by the therapist's hand by applying pressure or tension. Then, individual was asked to perform the contralateral side flexion movement actively in order to achieve lengthening. 5 to 7 repetition was given for ART.<sup>[3]</sup>

Following the respective treatment, both the groups were given 3 repetitions of static stretching for trapezius muscle with 30 sec. hold and isometric neck exercise for all movements 10 repetitions, and ice-pack for 20 minutes.

This treatment protocol was given for 5 days a week for 1 week. Following that data was collected for the post-treatment outcome measures.

## 4. Results

Statistical analysis was done by SPSS software version 23. Significance level was kept at 5%. Intragroup comparison was done by Wilcoxon test and intergroup comparison was done by Mann Whitney U test. Stastical analysis shows that when within group analysis is done P value is <0.05 suggesting that there is a significant difference between before treatment and after treatment for both the groups. But when between group analysis is done result shows no statical significant difference between the outcome measures suggesting both the treatments are equally effective

## 5. Discussion

The current study was conducted to identify the effect of IASTM and ART and to compare it on the upper trapezius pain. Neck pain prevalence is high among undergraduate students. [7] History of previous neck pain including that during schooling makes a student prone for the current episode of pain. Academic stress, smartphone and laptop use tend to aggravate the pain in those who have neck pain. [15] The current study suggest that both the techniques are effective in reducing pain and improving the ROM when pre-treatment data was compared to post treatment data within the groups, also when both groups were compared the statistics shows that there is no significant difference found in both reducing pain and improving ROM. Another study conducted by Rutika Thakur et al on Effectiveness of

Integrated Neuromuscular Inhibition Technique (INIT) and Instrument Assisted Soft Tissue Mobilisation in the Management of Upper Trapezius Myofascial Trigger Points concludes that IASTM is effective in reducing the pain and disability and improving ROM but INIT is more effective.<sup>[16]</sup>

The possible mechanism by which the IASTM can be effective is its ability to induce tissue micro-trauma. As scar tissue is removed by IASTM, normal functions will be achieved around the structures. Micro vascular and capillary haemorrhage, localised inflammation occurs as a result of pressure by IASTM. This inflammation stimulates the healing process by releasing adhesions, which in turn increase the blood and nutrient supply to the injured area and migration of fibroblasts. Finally, the regeneration of injured tissues will be enabled by forming a new collagen. [1]

Another study by Jun Ho Kim et. al on effects of the active release technique on pain and range of motion of patients with chronic neck pain and concluded that ART for the treatment of chronic neck pain may be beneficial for neck pain and movement.<sup>[17]</sup> A study conducted by Marzieh Mohammadi Kojidi, et al on comparison between the effects of passive and active soft tissue therapies on latent trigger points of upper trapezius muscle in women: single-blind, randomized clinical trial concluded that both passive and active soft tissue therapies were determined to reduce pain intensity and increase range of motion, although passive therapy was more effective in increasing pain pressure threshold (PPT) in these patients compared with the control group.<sup>[18]</sup> These studies show the effectiveness of ART in reducing pain and improving flexibility.

The possible mechanism that shows effect of ART could be that it is a method for treating soft tissues such as tendon, nerve, and myofascial and is performed for repetitive strain injury, acute injury, and damage to functional fixation due to abnormal long-term posture. In addition, ART reduces the adhesion of scar tissue and soft tissue causing discomfort, spasm, muscle fatigue, tingling and other symptoms.<sup>[12]</sup> The combined effect of tension and compression during ART protocol may be the mechanism showing the effect.<sup>[19]</sup>

Hence based on current study it can be concluded that both the treatment techniques show equal effectiveness in reducing pain and improving mobility.



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