



EFFECTIVENESS OF ULTRASOUND TECHNIQUE IN COMBINATION WITH ISCHEMIC COMPRESSION TECHNIQUE IN TREATMENT OF UPPER TRAPEZIUS MYOFASCIAL PAIN IN COMPUTER PROFESSIONALS

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ABSTRACT

Background: Ultrasound (US) and ischemic compression therapy (ICT) are commonly used non-pharmacological intervention for management of myofascial pain syndrome (MPS). However, their cumulative effect is still in doubt. **Objective:** To study the effectiveness of US in combination with ICT in treating upper trapezius myofascial pain in computer professionals. **Study Design:** Experimental design **Source of Data Collection:** DAV institute of physiotherapy, Yamunanagar. **Methodology:** 45 patient of upper trapezius MPS fulfilled the inclusion criteria were taken for the study and randomly assigned in three groups: Group A received US therapy, Group B received ICT, and Group C received US therapy along with ICT. The treatment was given for 10 days. Outcome measures of VAS, PPT and NDI were evaluated on 1st day, 5th and 10th day. **Result:** There was significant improvement in VAS, NDI & PPT with US, ICT & combination therapy. However there was no significant difference between the effects of 3 groups. **Conclusion:** Combination therapy does not have any additional effect in the treatment of upper trapezius myofascial pain.

KEYWORDS : upper trapezius MPS, ultrasound, ICT, PPT, NDI.

INTRODUCTION

Musculoskeletal system is the largest organ system by weight in the human body comprising of more than 400 skeletal muscles.¹ Problems associated with pain or fatigue to this system are among the leading reasons to visit the clinicians.² Myofascial pain syndrome (MPS) is one of the most common musculoskeletal pain diseases characterized by pain, muscle spasm, oversensitivity, and restricted range of motion due to trigger points (MTrPs) on constricted fibres of muscles and fasciae.³ It occurs in around 37% of males and 65% of females at age 30–60 years.⁴

MPS is the most common cause of back pain, shoulder pain, tension-type headache & regional pains.³ MTrPs are easily identified as hyperirritable nodules within taut bands of skeletal muscle which can produce a muscle twitch and referred pain. The factors responsible for primary activation of trigger points in neck and shoulder girdle muscles include postural disorders & overloading of muscles. The trapezius muscle is commonly involved structure in painful syndromes of head, neck and shoulder girdle. It may happen when the muscle is held in a position for a long time such as during operating a computer, driving a car or painting a ceiling.⁵ In addition to the physical demands of the job, muscle tension may arise from psychosocial stress factors,⁶ which induces sustained muscle activation; particularly in trapezius muscle.⁷

Association of prolonged static postures, lack of exercise, high body mass index sleep disturbance and emotional stress have been found to be the causative factors responsible for MPS. Concepts of MTrPs, associated research and clinical trials have improved our understanding of the pathogenesis of MPS. However clinical efficacy of treatment to alleviate pain has not been well established.⁸ Several trigger point treatment methods including injection or dry needling, Spray & stretch, TENS, Post isometric relaxation, ICT, & US have been studied for effectiveness.⁹

US is commonly employed in the management of various forms of musculoskeletal pain and has the ability to decrease short term local trigger point sensitivity.¹⁰ It is an inexpensive, non-ionizing form of radiation that it is easily integrated into a clinical setting.¹¹ Because of the ability to penetrate biologic tissues¹³ and non invasive therapy, US may be viable alternative to dry needle trigger-point therapy, injections or acupuncture.

ICT is the application of progressively strong, painful pressure using thumb or pressure algometer on trigger point to eliminate trigger points.¹⁴ On performing ischemic compression tissue attains recovery by reperfusion thereby relieving transient blood flow occlusion.¹² Few studies have seen the efficacy of combination of various treatments for MTrPs. But, none has studied effectiveness of US in combination with ICT. So, purpose of this study is to find effectiveness of US with ICT in treating upper trapezius myofascial pain.

OBJECTIVE

To study the effectiveness of US therapy in combination with ICT in treating upper trapezius myofascial pain in computer professionals.

MATERIAL AND METHODOLOGY

Study Design: Experimental.

Study Setting: DAV institute of Physiotherapy, Yamuna Nagar

Sampling method: Convenient sampling

Samples size: 45

Inclusion Criteria

- Patients having neck pain from 2 to 6 months.
- Age 30-50 years
- Computer professionals working on computer for 4-5 hours/day.
- Reproduction or aggravation of the clinical symptoms upon compression of the active MTrPs of upper trapezius.
- Baseline VAS ≥ 4 for Trapezius muscle.
- Subjects with NDI score 5 to 14 points (10-28%).

Exclusion criteria

- History of symptomatic disk disease or symptomatic degenerative joint disease.
- History of fracture or dislocation in the cervical vertebrae.
- Clinical evidence of radiculopathy or myelopathy.
- Fibromyalgia syndrome.

INSTRUMENTS AND TOOLS FOR DATA COLLECTION

- Algometer (Wagner Instruments)
- NDI (Neck Disability Index)
- VAS (Visual Analog Scale)
- Ultrasound Apparatus

PROCEDURE

Subjects who fulfilled the inclusion- exclusion criteria were included in the study and were randomly divided into 3 groups named Group A, B & C. Treatment was given for 10 days.

Group A: US Therapy with Intensity: 1.5 w/cm², continuous mode was given for 5 minutes.

Group B: ICT was given in supine lying with cervical spine in lengthened position & examiner at the head end of the table. Gradually increasing pressure was applied to upper trapezius MTrPs using thumb for 90 seconds.

Group C: Combination of US followed by ICT was given.

Outcomes of VAS, PPT & NDI were taken on 1st day pre & post intervention, 5th day & 10th Day post intervention.

- **VAS:** A 10 cm horizontal line ranging from zero (no pain) to ten (worst ever experiences).
- **PPT:** Subjects lie supine on couch and were told to inform when pain feels. Pressure was exerted on the tender point and reading was noted at which the patient feels pain. Two readings were taken and mean was calculated.



Measurement of Pressure pain threshold (PPT)

- **NDI:** A functional status questionnaire with 10 activities. Each section is scored on a 0 to 5 rating scale. Outcomes of the index are interpreted as: score of 10-28% (i.e., 5-14 points) is considered as mild; 30-48% is moderate; 50-68% is severe; $\geq 72\%$ is complete disability.

DATA ANALYSIS

Data analysis was done by SPSS 21 software. One way ANOVA applied to compare VAS, PPT & NDI score between groups.

DISCUSSION

Result indicates that all the three therapies are effective in managing upper trapezius MTrPs.

Improvement in Pain Intensity

Improvement in pain with Ultrasound therapy may be likely due to increase in local circulation that helps to break down the vicious cycle of ischemia and pain and also cause the reflex muscle relaxation.¹³ Effectiveness of ICT in reducing pain is explained by Hou CR et al who suggested that counter-irritant effect of ICT improves the blood supply of the area along with the relaxation of the involved muscle by spinal reflex mechanism.¹⁴

Improvement in PPT

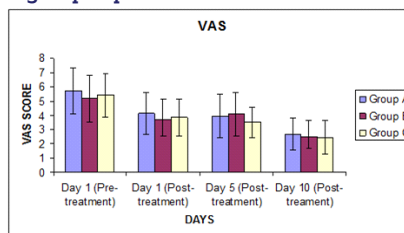
Hsieh YL explained that ultrasound increases the pain threshold by inducing anti-nociceptive effects segmentally through central neuro-modulatory mechanisms.¹⁵ Although possible explanation for improvement caused by ICT is that the local pressure may equalize the length of sarcomeres, which reduces the energy consumption and in turn consequently decreases pain and pressure sensitivity.¹⁶

Improvement in NDI

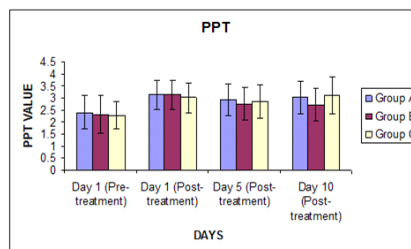
NDI in study showed significant improvement in disability in all the groups which could be due to significant reduction of

pain caused by all the three therapies.¹⁷

Between group improvement



Comparison of VAS between Groups



Comparison of PPT between Groups

Study reveals no significant difference in Pain intensity, PPT and NDI between the groups which suggest that all the three therapies are equally effective in treating upper trapezius MTrPs. Study found that combination therapy does not provide any additional cumulative effects as underlying mechanism for improvement in both groups is increase in blood circulation.

CONCLUSION

Study showed that combination therapy does not have any additional cumulative effect in the treatment of upper trapezius myofascial pain.

REFERENCES:

1. Robert B Salter. Textbook of disorders and injuries of the musculoskeletal system. 3rd edition. Lippincott Williams and Wilkins; 1999. Normal structure and function of musculoskeletal tissues; p. 23.
2. Victoria Wapf, Andre Busato. Main health related problems patients attended their physicians for. BMC complementary and alternative medicine. 2007; 7:41.
3. Rubin D. Myofascial trigger point syndromes: an approach to management. Arch Phys Med Rehabil. 1981; 62:107-110.
4. McNulty WH, Gevirtz RN, Hubbard DR, Berkoff GM. Needle electromyographic evaluation of trigger point response to a psychological stressor. Psychophysiology. 1994; 31:313-316.
5. Baldry PE. Myofascial Pain and Fibromyalgia Syndrome - A clinical guide to diagnosis and management, first edition, 2001, P: 121-135.
6. McNulty WH, Gevirtz RN, Hubbard DR, Berkoff GM: Needle electromyographic evaluation of trigger point response to a psychological stressor. Psychophysiology 1994; 31:313-316.
7. Waersted M, Westgaard RH: Attention related muscle activity in different body regions during VDU work with minimal physical activity. Ergo 1996; 39:661-676.
8. Hong CZ, Simons DG: Pathophysiologic and electrophysiologic mechanisms of myofascial trigger points. Arch Phys Med Rehabil 1998; 79:863-872.
9. Wheeler AH. Myofascial pain disorders: therapy to therapy. Drugs. 2004; 64(1):45-62.
10. Serby JZ, Dickey JP: Randomized control study of the antinociceptive effects of ultrasound on trigger point sensitivity: Novel applications in myofascial therapy? Clin Rehab 2007; 21:411-417.
11. Serby JZ, Dickey JP: Stimulation of myofascial trigger points with ultrasound induces segmental antinociceptive effects: A randomized controlled study. Pain 2008; 139:260-266.
12. Simons D. G, Travell J. G, Simons L. S. Myofascial Pain and Dysfunction: The Trigger Point Manual. Volume 1. Baltimore, Md, USA: Lippincott Williams & Wilkins; 2005.
13. Simons D: Clinical and etiological update of myofascial pain from trigger points. J Musculoske Pain 1996; 4:93-121.
14. Hou CR, Tsai LC, Chung KC, Cheng KF, Hong CZ: Immediate effects of various therapeutic modalities on cervical myofascial pain and trigger point sensitivity. Arch Phys Med rehab 2002; 83:1406-1414.
15. Hsieh YL: Reduction in induced pain by ultrasound may be caused altered expression of spinal neuronal nitric oxide synthase producing neurons. Arch Phys Med Rehab 2005; 86:1311-1317.
16. Simon DG: Understanding effective treatments of myofascial trigger points. J Body Work and MovTher 2002; 6:81-88.
17. Harman KM, Reese CS: Relationships among selected measures of impairment, functional limitation and disability in patients with cervical spine disorders. Phys Ther 2001; 81:903-912.