

# Efficacy of Ischemic Compression Techniques and Home Exercise Programme in Combination with US among Computer Users with Upper Trapezius Myofascial Pain

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## ABSTRACT

**Background:** Myofascial pain syndrome associated with upper trapezius trigger point is a common problem in computer users. Various manual therapy approaches is available for treatment of upper trapezius trigger point. Adjunct treatment along with home exercise program is long term effective to improve VAS, PPT and NDI in patient associated with upper trapezius trigger point.

**Objective:** To check the efficacy of ischemic compression techniques and home exercise programme in combination with US among computer users with upper trapezius trigger point.

**Intervention:** 45 subjects with upper trapezius trigger point full fill in inclusion and exclusion criteria divided in to 3 groups by chit chat method. Group A 15 subjects receive intervention in the form of ischemic compression technique and home exercise programme along with US. Group B 15 subjects receive intervention in the form of ischemic compression techniques and US. Group C 15 subjects receive intervention in the form of US only.

**Study design:** Pre and post control group experimental. Outcome measure: VAS, PPT and NDI.

**Results:** Within and between group analysis Group A and Group B are statistically significant and control Group C is statistically in significant. Group A is highly significant in comparison to Group B

**Conclusion:** Ischemic compression techniques and home exercise programme in combination with US is more effective and beneficial intervention for management of upper trapezius trigger point.

**Keywords:** Ischemic compression techniques, Home exercise programme, Ultrasound, Upper trapezius trigger point

## INTRODUCTION

Myofascial Pain Syndrome, a common type of non-articular musculoskeletal pain associated with regional pain and muscle tenderness characterized by the presence of hypersensitive nodules, also called myofascial trigger points. Myofascial pain Syndrome affects up to 95% of people with chronic pain disorders and is a common finding in subjects with computer worker.<sup>1,2</sup> Although Myofascial trigger point have been diagnosed in children & young adults, most often seen in the age range 31-50

years.<sup>3</sup> Myofascial pain syndrome is characterized by trigger points, which are defined as hyperirritable spots within taut bands of skeletal muscle fibres. The syndrome is associated with tenderness in the muscle, characteristic referred pain, spasm and restriction of motion.<sup>4</sup> the etiology of myofascial pain includes a number of factors, work related pain being the most significant causes.<sup>5</sup> Activation of a trigger point is usually associated with some degree of mechanical abuse of the muscle in the form of muscle overload, which may be, acute, sustained or repetitive.<sup>6</sup> Likewise the

activation of trigger points in the upper trapezius muscle results from the stress of sustained elevation of the shoulders as when holding a telephone receiver without elbow support or sitting in a chair operating with inadequate arm rest. Computer usage for prolonged hour is seen to aggravate these phenomena in shoulder and neck. Other related factor such as physical deconditioning due to lack of exercises, sleep disturbances (irregular & prolonged duty hours), prolonged study, faulty posture (protracted shoulder) and other psychosocial and behavioral disturbances (Highly stressful work environment) makes Computer professionals (Prolonged computer users) as an perfect host for the development of myofascial trigger points over a period of time.<sup>7</sup> Myofascial pain syndrome responds well when treatment is targeted at the trigger points. The various treatment techniques that are utilized for treating trigger points are LASER, trigger point injection, spray and stretch method, dry needling, ultrasound, TENS, trigger point pressure release, ischemic compression, muscle energy technique, myofascial release therapy, positional release therapy i.e. strain counter strain technique and integrated neuromuscular inhibitory technique.<sup>8,9</sup> Myofascial release technique decrease pain, strengthens the immune, improves nerve functions and increases blood circulation. Myofascial release techniques are used to improve movement potentials, reduce restriction, release spasm, and ease pain.<sup>10</sup> Due to lack of evidence of long term efficacy of ischemic compression techniques in combination with home exercise programme along with US in improving VAS, PPT and NDI scores.

Therefore the aimed of this study was to check the efficacy of ischemic compression techniques in combination with home exercise programme along with US in improving VAS, PPT and NDI scores. This research will pave a path for the research. It helps to plan out an effective interventional

protocol for patients with upper trapezius myofascial trigger point in computer users.

## **MATERIAL AND METHODS**

### **Subjects**

This study was conducted in department of physiotherapy Integral University Lucknow after ethical clearance of institutional ethical review committee. A convenience sample of 40 male professional computer users was recruited through announcements. Before the participation, all participants signed a consent form and were excluded if they are female; participant had bilateral upper trapezius pain and fibromyalgia. Participants were included in the study if the age 19-38 years age male and participants who had diagnosed with active two myofascial trigger points of upper trapezius muscle and participants were not receive any treatment for myofascial pain in post one month. The subjects for the study were randomly assigned to 3 group A, B and group C via Chit chat method where group A,B was experimental and C was control. Group A received Ischemic compression technique and home exercise programme (Self postural correction exercises) along with ultrasound and Group B received Ischemic compression technique and ultrasound, Group C received only ultrasound.

### **Outcome measure**

For group A, B and group C subjects the PPT, VAS and NDI was used as an outcome measure. For VAS and NDI was used a scale and PPT was assessed using a manual algometer. To determine the area of the possible trigger point, the subjects were asked to point to the painful area in the upper trapezius muscle. Then I palpated the upper trapezius region on one side with a washable skin marker, marked the major active trigger point/points present on it. I measured its distance from the nearby spinous process with a tape measure. A corresponding contra lateral side was also marked at the same spinal level. The tip of the Pressure Threshold Meter was placed perpendicularly over the most sensitive site

and the pressure was increased gradually until the subject indicated by saying 'yes', when the pressure became the painful. The hold button was pressed and the maximum pressure displayed by the Pressure Pain Threshold Meter was recorded, the pressure was released immediately.<sup>11</sup>

Measurement of pain intensity after the pre-treatment data of the PPT, a second application of 2.5 kg/cm<sup>2</sup> of pressure was applied by me. Instruct to patient rate their pain on the VAS, assessment of local pain provoked by the application of that amount of pressure.

The Neck disability index (NDI) is designed to measure neck functional disability. The measure is designed to be given to the patient to complete and can provide useful information for management and prognosis those with neck pain. A baseline measurement day 1 pre, post and day 7, 14 post-intervention measurements were taken 2 minutes after the application of the technique by me in the same way as in the pre intervention measurements. A follow up measurement of all three outcome measure were taken after 2 week of termination of treatment

### **Intervention**

**Group A;**  
Ischemic Compression technique; Subject was positioned in the high sitting position, with the involved side exposed appropriately. The researcher was stand behind the subject and give intervention in the form of Ischemic Compression technique. Once trigger point was identifying on the upper fibers of the trapezius, researcher was use a pincer grasp placing the thumb and index finger over the active trigger point. Slow and increasing levels of pressure were applied until the tissue resistance barrier is identified. Pressure was maintained until a release of the tissue barrier is felt. At that time, pressure was again applied until a new barrier is felt. This process was repeated until tension/tenderness is unable to be identified or 90 s have elapsed, whichever

would come first. Patient was receive treatment 3 times a week for 2 consecutive weeks.<sup>12</sup>

**Therapeutic Ultrasound;** Ultrasound was applied over the identified myofascial trigger point in upper trapezius for 6 minutes (Intensity = 0.2-0.5watt/cm<sup>2</sup>, Frequency = 1 MHz, continuous mode) treated 3 times a week for 2 consecutive weeks.<sup>13</sup>

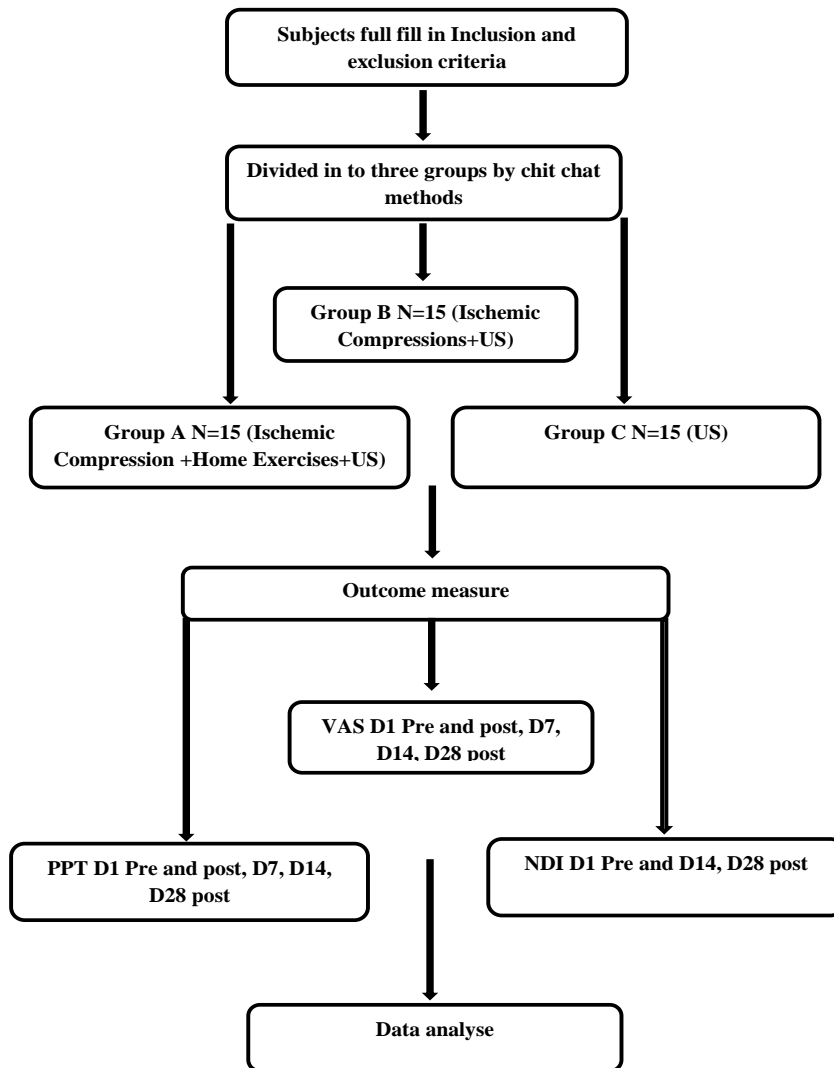
**Home Exercise programme;** Researcher was provide a hand out programme of postural exercises to the patient with prescribe dose. All patients were instructed to follow the hand out programme 2 times a day for two weeks.

**Group B;** Group B was received same treatment as group A except home exercise programme

**Group C;** Group C was received only therapeutic ultrasound as same as group A and B

**Statistical analysis;** Statistical analysis was done using SPSS 15.0 Software. Repeated Measures ANOVA and One Way ANOVA were applied with 95% confidence interval and the level of significance  $\alpha$  was set at 0.05. One way ANOVA was used for between group comparisons of group A with group B, group A with group C, and group B with group C, for reading at day 0 pre and post intervention, day 7 post intervention, day 15 post intervention and 2 week of follow up after the termination of intervention. The variables within the group were compared using repeated Measures ANOVA test for pairs of day 0 (Baseline value) versus immediate post intervention at day 0, day 7, day 15 and 2 week of follow up after the termination of intervention, day 0(post intervention) versus day 7 (post intervention), day 0 (post intervention) versus day 15 (post intervention), day 0(post intervention) versus 2 week of follow up, day 7 (post intervention) versus day 15 (post intervention), day 7 (post intervention) versus follow up and day 15 versus follow up.

**Protocols**



**RESULT**

Below table shows that VAS, PPT and NDI is statistically significant in Group A, B and statistically in significant in Group C which was control group. Group A is highly significant in comparisons to group B. ANOVA calculated significant difference (F value and p value) between and within group for VAS DI – post (F= 5.37 and p= .004), VAS D7-post (F=27.66 and p= .003), VAS DI4 – post (F= 48.44 and p= .002), and VAS D28 – post (F= 27.77 and p= .003). Statistically significant difference (F value and p value) between and within group for PPT D1 to D28 which is (F= 27.97 and p= .002) and also statistically significant between and within group for NDI D1 to D28 which is (F= 19.68 and p=.004)

**Table 1 Intergroup comparison of VAS**

VAS	Group A	Group B	Group C	F value	P value
D1 Pre	7.13 ± 2.70	7.40 ± 2.50	7.34 ± 2.40	.127	.961
D1 Post	5.30 ± 2.89	5.47 ± 2.35	6.06 ± 2.22	5.37	.004
D7 Post	3.74 ± 2.57	4.30 ± 2.05	6.06 ± 2.33	27.66	.003
D14 Post	2.68 ± 1.39	3.13 ± 2.96	5.53 ± 2.50	48.44	.002
D28 Post	1.85 ± 0.95	2.43 ± 1.99	7.20 ± 2.01	27.77	.003

**Table 2 Intergroup comparison of PPT**

PPT	Group A	Group B	Group C	F value	P value
D1 Pre	2.73 ± .48	2.67 ± .48	2.71 ± .45	.067	.936
D1 Post	4.59 ± .75	3.86 ± .47	2.84 ± .44	5.76	.005
D7 Post	4.57 ± .68	3.48 ± .44	2.85 ± .43	27.06	.004
D14 Post	4.97 ± .63	3.61 ± .46	2.84 ± .44	49.19	.003
D28 Post	4.88 ± .67	3.48 ± .47	2.64 ± .36	27.97	.002

**Table 3 Intergroup comparison of NDI**

NDI	Group A	Group B	Group C	F value	P value
D1 Pre	11.20 ± 3.29	11.46 ± 3.15	10.40 ± 3.39	0.20	.802
D14 Post	3.00 ± 2.25	4.8 ± 2.56	9.00 ± 2.90	20.43	.004
D28 Post	3.33 ± 2.71	4.00 ± 2.92	9.40 ± 2.94	19.68	.004

## DISCUSSION

This study was conducted in an attempt to identify the efficacy of ischemic compression techniques and home exercise programme in combination with US among computer users with upper trapezius myofascial pain. The findings suggest that ischemic compression technique and home exercise programme in combination with ultrasound therapy influence of myofascial upper trapezius trigger point patient. The result indicates ischemic compression technique and home exercise along with ultrasound is better than in comparison of ischemic compression techniques and ultrasound. The result of our study very similar to study of Hanten et al. the effectiveness of a home program involving ischemic compression techniques in patient with myofascial upper trapezius trigger point was examined. The results of their study clearly revealed that the combination therapy along with home exercise programme was more effective in decreasing pain trigger point and functional status of patient.<sup>14</sup> a study conducted by Fryer and Hodgson have concluded that the ischemic compression technique was better than sham treatment in reducing upper trapezius myofascial trigger point.<sup>15</sup> Improvement in VAS may be result from hyperemia in upper trapezius myofascial trigger point region or spinal reflex mechanism for the relief of muscle spasm by receiving ischemic compression techniques and home exercises programme along with ultrasound.<sup>16</sup> Local pressure may equalize the length of sarcomeres in the involved myofascial trigger point and

consequently decrease pain.<sup>17</sup> Deep pressure could offer effective stretching and mobilization of the taut bands. Since, the group A received Ischemic compression and home exercise programme along with ultrasound, so the higher gain in pain relief and increase pain pressure threshold may be attributed to the above mechanism explained and supported by different previous studies.<sup>18,19</sup>

Our results suggest that a combination of ischemic compression technique and home exercise along with ultrasound is more effective in improving VAS, PPT and NDI in patient of upper trapezius myofascial trigger point.

## CONCLUSION

The result of this study showed that ischemic compression techniques and home exercise programme along with ultrasound is more effective in improving VAS, PPT and NDI score in comparison to other treatment received by group B and C. The dependent variables were found to improve from baseline to 14 days and also after 14 day follow up in group A and group B not in group C. Greater improvement was seen in group A where ischemic compression techniques and home exercise was given along with ultrasound.

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