Research Article

Effect of Pressure Release and Positional Release with Phonophoresis in Management of Myofascial Trigger Point of Trapezius

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ABSTRACT

Objectives: To study the effectiveness of pressure release with Phonophoresis in the myofascial trigger point. To study the effectiveness of positional release therapy with Phonophoresisin myofascial trigger point of Trapezius.

Materials and Method: The study was carried out at physiotherapy OPD KIMSDU, Karadafter the ethical clearance. A total of 60 samples was selected based on inclusion and exclusion criteria and divided into 2 groups by a simple random sampling method. Group A was treated with pressure release therapy and phonophoresis. Group B was treated with the positional release with phonophoresis. The intervention was given for 2 weeks. The outcome measures were visual analog scale, cervical rom. Statistical analysis was done using paired and unpaired t-test.

Results: The results showed a statistically extremely significant improvement in pain and cervical flexion in both the groups ($p<0.0001$). Between-group analysis showed statistically significant improvement if group A (pressure release) than group B (positional release.)

Conclusion: Both the manual therapy techniques can be used for treating myofascial trigger points of the trapezius muscle.

Keywords: Trigger point; Trapezius; Pressure release; Positional release; Visual analogue scale; Pain; Phonophoresis

Introduction

Myofascial Pain Syndrome (MPS) is a non-inflammatory disorder of musculoskeletal origin characterized by the presence of hyperirritable palpable nodules in the skeletal muscle fibers which are termed "Trigger Points (MTRPS)". It has symptoms of local pain and muscle stiffness [1,2].

MTRPS are painful on compression and can result in referred pain, motor dysfunction, referred tenderness, and autonomic phenomena [3].

Myofascial Trigger Points produces pain to any activating stimulus which provokes referred pain, motor dysfunction, and referred tenderness. It also causes a reduction in the range of motion [4,5]. Treatment options for TRPS include trigger point injections, dry-needling, stretching exercise, massage therapy, and Positional Release Therapy (PRT) [6,7].

The prevalence of myofascial pain syndrome which is an important source of musculoskeletal dysfunction has dramatically increased [8,9].

The prevalence of myofascial trigger points in scapular muscles was found to be 90% in healthy adults. The most common muscle which frequently has myofascial trigger points is trapezius [10,11] gender-wise, women's are more affected than men's [12,13]. The myofascial trigger points reduce muscle efficiency, decreases the joint range of motion, causes muscle weakness, disturbs normal patterns of motor recruitment [14,15].

The upper trapezius is designated as a postural muscle that is highly susceptible to overuse. The function of the trapezius is neck rotation, side flexion, extension. The tightness of trapezius

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causes limitations in this range of motion which in turn affects the mobility of the cervical spine [15-18].

A combination of manual therapy and mechanical agencies (modalities) can be an effective approach to achieve the aim in trigger point treatment of trapezius.

Pressure release is a technique that is employed to deactivate trigger point by applying direct sustained pressure to trigger point over a dedicated time duration. The pressure is applied, maintained and gradually released [5].

Positional release involves passive body positioning in such a way that allows spontaneous response that releases or reduces excessive tension/ spasm [19].

Phonophoresis is a therapeutic method that helps with the treatment of MTP. There is little information about the mechanisms of this technique. There is a lack of evidence of the effect of phonophoresis on trigger point therapy. So, we decided to compare Phonophoresisof Hydrocortisone (PhH) along with manual therapy on trigger points of trapezius [20].

The treatment of trigger point always require a multifaceted approach. The aim is to relieve the taut bands which will cause pain reduction and increase the flexibility to reduce the recurrence.

So the present study was conducted with the objective to:

- To study the effect of pressure release with phonophoresis on pain, cervical range of motion and function on myofascial trigger points of trapezius
- To study the effect of positional release with phonophoresis on pain, cervical range of motion and function on myofascial trigger points of trapezius
- To compare the effect of both on myofascial trigger points of trapezius

Material and Methodology

Ethical clearance was taken from the institutional ethical committee of KIMSDU, Karad. 60 patients with the age range of 20-33 years with inclusion criteria mentioned in **Table 1** were included in the study. They were randomly assigned into two Groups A and B. Patients were assessed for pain, cervical range of motion and neck disability index pre interventionally on day 1. All the procedures were explained to subjects before screening or measurements. The intervention was given for 14 days (2 weeks) and the post-intervention outcome measures were taken. Group A treated with phonophoresis and manual pressure release.

- **Phonophoresis:** Pulse mode was selected on ultrasound for 7 minutes with 1% hydrocortisone
- **Manual pressure release:** Subjects were encouraged to relax as much as possible before pressure was applied. The researcher applied slow pressure to the MTrPs until 70% of the subject's pain feeling. The pressure was sustained for 60 seconds and was monitored to maintain constant pressure. If the subject reported that the pain decreased to 30%, the researcher slowly increased the pressure to restore the perceived pain to the original value of 70% [21]
- **Positional release therapy:** The patient was seated with the cervical spine in a neutral position. The therapist located the trigger point in the upper trapezius muscle by manual palpation. The therapist applied gradually increasing pressure until the sensation of pressure became one of pressure and pain. At that moment, the patient was then passively placed in a position that reduces the tension under the palpating fingers and causes a subjective reduction of pain by around 70%. The position was usually cervical extension, ipsilateral side-flexion, and a slightly contra-lateral cervical rotation (5-8 degrees). The patient's upper extremity positioned in passive abduction. This position was maintained for the 90s. Finally, the patient was slowly passively

Table 1: Inclusion and exclusion criteria for study.

Inclusion criteria	Exclusion criteria
Presence of palpable taut band in the skeletal muscle	History of whiplash injuries or surgical interventions on neck or upper limb
Presence of hypersensitive spot in taut band	Fibromyalgia syndrome
Reproduction of typical referred pain pattern in response to compression of tender spots	Radiculopathic pain, myelopathy
Spontaneous presence of typical referred pain pattern	Have undergone myofascial pain therapy within past month before the study

placed in the neutral position of the cervical spine [4].

- **Statistical analysis:** Statistical analysis for the present study was done manually as well as using the statistics software INSTAT to verify the results obtained. Various statistical measures such as mean, standard deviation and paired and unpaired tests of significance were utilized for this purpose. Probability values less than 0.05 were considered statistically significant and probability values less than 0.0001 were considered statistically extremely significant

Results

Visual analogue scale

- The within-group analysis showed that the pre interventional pain score for group A was 7.16 ± 1.56 and post was 0.39 ± 0.52 which was statistically extremely significant
- The within-group analysis showed that the pre interventional pain score for group B was 7.13 ± 1.76 and post was 0.81 ± 0.59 which was statistically extremely significant
- The between-group analysis showed that the post interventional value for group A was statistically very significant than group B (p=0.0056)
- Thus pain was reduced in both the groups, but more improvement was seen in group A (pressure release) than group B (positional release) **(Table 2)**

Cervical lateral flexion(right side)

- The within-group analysis showed that the pre interventional cervical right lateral flexion for group A was 28.21 ± 4.12 and post was 40.19 ± 3.6 which was statistically extremely significant (p<0.0001)
- The within-group analysis showed that the pre interventional cervical right lateral flexion for group B was 27.09 ± 4.26 and post was 38.63 ± 3.59 which was statistically extremely significant (p<0.0001)
- The between-group analysis showed that the post interventional value for group A was statistically not significant than group B (p=0.1013). Thus, cervical right lateral flexion was improved in both the groups **(Table 3)**

Cervical lateral flexion (left side)

- The within-group analysis showed that the pre interventional cervical left lateral flexion for group A was 37.75 ± 6.38 and post was 43.50±2.86 which was statistically extremely significant (p<0.0001)
- The within-group analysis showed that the pre interventional cervical left lateral flexion for group B was 37.70 ± 5.50 and post was 41.25±3.93 which was statistically extremely significant (p<0.0001)
- The between-group analysis showed that the post interventional value for group A was statistically significant than group B (p=0.002)
- Thus, cervical left lateral flexion was improved in both the groups, but statistically significant in group A than group B **(Table 4)**

Cervical forward flexion

- The within-group analysis showed that the pre interventional cervical right lateral flexion for group A was 40.56 ± 4.18 and post was

Table 2: Pre and post intervention visual analogue scale.

	Group A (pressure release)	Group B (positional release)	p-value
Pre intervention	7.16 ± 1.56	7.13 ± 1.76	0.9508 (ns)
Post intervention	0.39 ± 0.52	0.81 ± 0.59	0.0056 (vs)
p-value	<0.0001(e.s)	<0.0001(e.s)	
T-value	21.439	22.141	

Table 3: Pre and post intervention cervical right lateral flexion range of motion.

	Group A (pressure release)	Group B (positional release)	p-value
Pre intervention	28.21 ± 4.12	27.09 ± 4.26	0.3039 (NS)
Post intervention	40.19 ± 3.6	38.63 ± 3.59	0.1013 (NS)
p-value	<0.0001(ES)	<0.0001(ES)	
T-value	16.882	12.197	

Table 4: Pre and post intervention cervical left lateral flexion range of motion.

	Group A (pressure release)	Group B (positional release)	p-value
Pre intervention	37.75 ± 6.38	37.70 ± 5.50	0.895
Post intervention	43.50 ± 2.86	41.25 ± 3.93	0.002
p-value	<0.0001	<0.0001	Significant

Table 5: Pre and post intervention cervical forward flexion range of motion.

	Group A (pressure release)	Group B (positional release)	p-value
Pre intervention	40.56 ± 4.18	41.23 ± 2.2	0.4420 (ns)
Post intervention	47.16 ± 2.5	45.63 ± 2.4	0.0190 (significant)
p-value	<0.0001 (ES)	<0.0001 (ES)	
T-value	7.551	8.635	

47.16 ± 2.5 which was statistically extremely significant (p<0.0001)

- The within-group analysis showed that the pre interventional cervical right lateral flexion for group B was 41.23 ± 2.2 and post was 45.63 ± 2.4 which was statistically extremely significant (p<0.0001)
- The between-group analysis showed that the post interventional value for group A was statistically than group B (p=0.0190). Thus, cervical left lateral flexion was improved in both the groups, but statistically significant in group A than group B **(Table 5)**

Discussion

The results after a statistical analysis showed that there was an extremely significant difference in both the groups pre and post interventional. The between-group analysis showed that there was a statistically significant improvement in pain, cervical left lateral flexion and forward flexion in group A than group B indicating that group treated with pressure release therapy showed more improvement than the group treated with positional release therapy.

The improvement by pressure release technique is because it may cause pain reduction and improve the involved myofascial trigger points of trapezius by modifying the length of the sarcomere of the muscle. Some studies have shown that blood supply may be limited in the neighborhood of the palpable myofascial trigger point. The pressure release therapy could be effective when ischemia and hypoxia are removed from the area.

After maintaining the sustained pressure over the myofascial trigger point, ischemia is created and after the release of pressure, a sudden increment in local blood flow was inevitable. Increase blood flow may clean out pain-producing substances from are and stimulation of pain receptors may be reduced accordingly [22,23].

The study has also shown that there was improvement post interventional in pain and cervical range of motion in group B treated with positional release therapy. A study done by Weiselfish showed that PRT begins to engage the fascial tension patterns associated with trauma, inflammation, and adhesive pathology. It causes "unwinding" action in the myofascial tissue. A significant release response may be palpated during this phase and normalization of fascial tension [24].

According to the Korr model placing the muscle in a shortened position decreases muscle spindle activity and enables the central nervous system to decrease gamma discharge activity, therefore inhibiting the facilitated segment of the spinal cord. Thus, by shortening extrafusal fibers, the intrafusal and extrafusal fibers disparity decreases gamma discharge is turned down. This enables muscle to return to its normal resting length as hyperactive muscle spindle ceases to fire [25,26].

The phonophoresis is also effective for the treatment of latent mtps. Tissue repair created by mechanical effects of ultrasound might be the reason behind some positive effects on latent mtps. The significant reduction in the symptoms may be attributed to the effect created by the ultrasound and also the hydrocortisone drug used for phonophoresis [27,28].

Conclusion

The study concluded that both the techniques the pressure release and positional release are

effective in trigger points of the trapezius. But pressure release was found to be significantly effective than positional release.

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