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Original Research Article

A Comparative Study of Immediate Effects of Myofascial Release Technique and Positional Release Technique on Trapezitis among the College Student

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ABSTRACT

Background: Trapezitis is one of the common inflammatory conditions seen among college going students due to prolonged faulty posture, overuse, stressful neck movement, etc. Students with trapezitis usually complaints of pain, decreased range of motion and difficulty in activities of daily living.

Objectives: To compare the immediate effects of Myofascial Release Technique and Positional Release Technique on pain intensity, cervical range of motion, and neck disability index in trapezitis among college students.

Methodology: A total of 100 students with trapezitis meeting the inclusion and exclusion criteria were allocated into two groups to receive single session of Myofascial Release Technique and Positional Release Technique respectively. Pre and Post intervention scores of VAS, CROM and NDI were measured.

Results: Post intervention score of pain intensity in terms of VAS, cervical range of motion and NDI score showed extremely significant improvement within the groups ($p<0.0001$). While comparing between two groups, there was no statistical significance.

Conclusion: Myofascial Release Technique and Positional Release Technique both are effective in the treatment of trapezius trigger points associated with postural neck pain.

KEYWORDS: Trigger Points, Students, Myofascial Release Technique, Positional Release Technique, Active Trigger Point, Latent Trigger Point, Trapezitis.

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INTRODUCTION

Trapezitis can be well-defined as “an inflammation of neck and upper back muscle” name trapezius which involve myofascial pain syndrome [1]. This muscle helps in actions like shrugging shoulders and neck movements like extension of a neck, which is produced by bilateral contraction of descending trapezius fibres, while lateral flexion of neck is produced by unilateral contraction of descending fibre [2].

Its prevalence is maximum in females with middle age and less common in males with is fluctuating with mean point prevalence of 13% and neck pain occurs usually in upper trapezius muscle. Mechanical neck pain has a

lifetime prevalence of 30-50% in general world population [3].

The pain generally arises due to overuse of the muscle in non-ergonomic posture, working in static position, stress and tension, repetitive movements, siting for prolong period of time without back support, too high keyboard on desks, long drives on bikes and cars, prolong head bending activities (reading/ looking through microscope/dentistry), tight pectoralis major and minor muscles, activities with sudden one sided movements, it may also be activated by stressful thoughts and feeling or abnormal breathing pattern [4]. More recent studies have shown a relationship between trapezius muscle activation and pain [5,6], because the upper fibres of trapezius muscle fibres are often placed in a shortened position by poor ergonomics which creates shortness in their length [7].

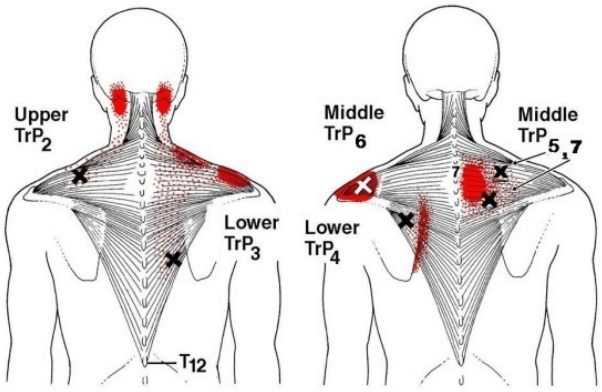


Fig. 1: Trapezius muscle and trigger point. (Source of Image at authors risk).

The pathogenesis of trapezitis could be explained as the areas of stressed soft tissue receiving less oxygen, glucose, and nutrient delivery, and subsequently accumulate high levels of metabolic waste products and end up with the development of Trigger Points (TP) [8]. Trigger points are hyperirritable foci combined with nodule or band palpated over the muscle belly. Simons and et all described criteria for identification of taut band in their study as "a tender spot on the taut band, referred pain or altered sensation at least 2 cm beyond the spot, elicited by pressure held for less than 10 seconds; and sometimes it may restrict cervical ROM in the joint" [9]. Once the trapezitis is diagnosed there are many treatment plans available includes pharmaco-logical interventions such as non-steroidal anti-inflammatory and pain-modulating therapies like electrotherapy modalities[1], stretching, MET, positional and myofascial release technique [10,11]. As the MFR and PRT both are treating cause rather than symptoms. Considering the goals of present study focuses on reducing pain, improving range and reducing functional disability a therapeutic option that targets maladaptive changes in patients suffering from trapezitis.

Myofascial release technique can be defined as a soft tissue mobilization technique which acts as a catalyst in the reduction of trapezius spasm and ultimately pain is reduced [12]. The faster moving pressure stimuli hinder the transmission of painful stimuli to the brain, thus "closing the gate" to the brain cannot perceive the pain anymore. The release of serotonin also blocks the transmission of noxious stimuli and not allowed to reach brain. Myofascial release's ability to alleviate pain may relieve muscle spasm, which can be attributed to the application of direct pressure as well [13]. It acts by relaxing contracted or shortened muscles, it also increases blood circulation, improves lymphatic drainage, stimulating the stretch reflex of muscles and overlying fascia and it gives the desired effect [14].

Positional release technique is a manual technique that re-establishes a muscle to its normal resting tone. When the muscle is held in shorten position for longer period of time it causes adaptive shortening and ultimately it leads to spasm. During this technique fiber are lengthened that approximate the origin and insertion of the hypertonic muscle. Due to this position muscle spindle activation is inhibited thereby decreasing the amount of efferent impulses to the brain. There efferent impulses were trying to guard the tissue from being over structured. By interposing this pathway, the patient's muscle is allowed to relax and assume a normal resting tone. The process is completed by slowly and passively returning the patients to an automatically neutral position without firing of the muscle spindle [15] and it gives the desired effect.

Thus, both are proved effective in their own way but none of the study compared them

together. Thus the objectives of this study is to find the immediate effects of myofascial release technique and positional release technique on pain, cervical range of motion and neck disability index questionnaire in the participants with trapezitis among college students.

MATERIALS AND METHODS

Acomparative prospective study was conducted at Department of Orthopaedic Physiotherapy, Dr. A.P.J. Abdul Kalam College of Physiotherapy, Pravara Institute of Medical Sciences, Loni and receivedethical clearance from the Institute (ref no. PIMS/CPT/IEC/2020/77). It was conducted for duration of one year. Total of 100 participants had participated in the study. The inclusion criteria were as follow: participants within the age group of 18-26 years, male and female participants, VAS value between 4 to 7 out of 10, participants with unilateral or bilateral trapezius tender point, duration of the pain from 7 days to 1 month, participants willing to sign the written inform consent form.

Regarding exclusion criteria, recent history of trauma or fracture in cervical spine, recent cervical spine surgery, skin disease around part to be treated, participants on any anti-inflammatory drugs, brachial neuralgia e.g. prolapse intervertebral disc, neck deformities like scoliosis or torticollis, sensory disturbance near treating part, signs of radiculopathy or myopathy**.** Total 100 participants were included and written informed consent was taken then baseline data and pre intervention assessment was done. After that the randomization within the groups was done by even and odd numbers Group A (n=50) (MFR) and Group B (n=50) (PRT).

The effectiveness of intervention was assessed using the outcome measure visual analogue scale (VAS), cervical range of motion by universal Goniometer and Neck Disability Index Questionnaire (NDI).The participants inGroup A received MFR in whichpressure was applied for 90 seconds followed by 15 sec of rest period. Repeat it for 3 times**.** Group B received PRT during thisthe ideal position of comfort achieved as held for a period of 90seconds followed by 15 sec rest and followed by a passive return of the body part to an anatomically neutral position repeat for 3 times. The single session was these treatments were given and then immediate effects were assessed according to the outcome measures and then they were compared.

Outcome Variables

VAS: It is a measurement instrument that tries to measure the characteristics or attitude that is believed to range across a continuum of values. A straight horizontal line of fixed 10 cm length with the ends defined as the extreme limits of the pain to be measured, oriented from left (no pain) to right (severe). The patient was asked to mark on the line, the point that they feel represents their perception of current pain. Its reproducibility has been recognized in individual subjects (ICC=0.97) [16].

Cervical Range of Motion:

All the motions were assessed by using Universal Goniometer. This test has satisfactory psychometric properties with ICC measurements for intra and inter examiner reliability that ranges from 0.80 to 0.93 [17-19].

Neck Disability Index:

Function ability was assessed on the base of neck disability index questionnaire. It is a patient - completed condition specific functional status questionnaire with 10 item. It has sufficient support and usefulness to retain its current status as the most commonly used self – report measure for neck pain. Each section is scored on a 0 to 5 rating scale, in which zero means 'No pain and 5 means 'Worst imaginable pain'. All the points can be summed to a total score. The test can be interpreted as a raw score of 50, or a percentage.

DATA ANALYSIS AND RESULT

Statistical analysis was carried out utilizing demo version of PRIMER software and p value 0.05 is considered as level of significance unpaired 't' test was applied to analyse the data.

Table 1: Comparison of mean of VAS score between Group A and Group B

VAS	Mean ±SD		't' value	'p' value	Result
	Pre	Post			
Group A	5.94 ± 1.1018	2.22 ± 0.975	19.846	<0.0001	Extremely Significant
Group B	5.84 ± 1.131	2.48 ± 0.9528	18.198	<0.0001	Extremely Significant
Group A v/s Group B	Group A Post 2.22 ± 0.975	Group B Post 2.48 ± 0.9528	-1.349	0.181	NotSignificant

Graph 1: Comparison of mean in post intervention between Group A andGroup B using VAS where t value is -1.349 and p value 0.181 which is statistically not significant, whereas within the group it was significant.

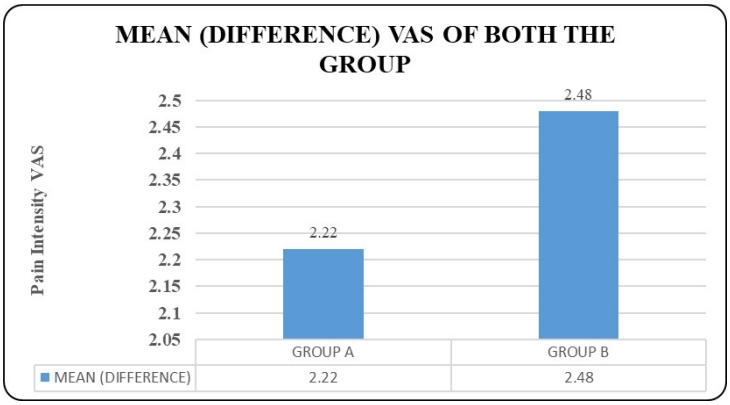
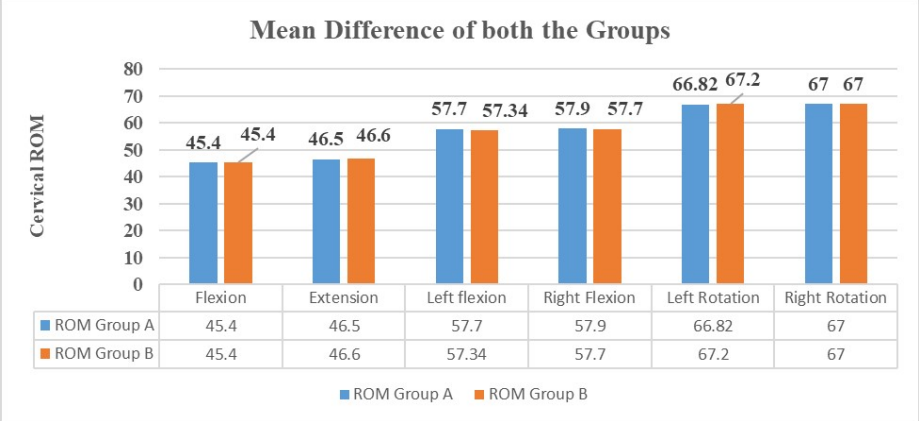


Table 2: Comparison of Post treatment mean difference values between Group A and Group B of cervical ROM between both the groups are as follow: Flexion: 45.4±1.37and 45.4±1.37 (p -Value: 1), Extension: 46.5±2.315and 46.6±2.564(p-Value:0.838), Left Flexion: 57.4±4.541and 57.34±4.529 (p – Value:0.692), Right Flexion: 57.9±4.414 and 57.7±4.854 (p -Value: 1), Left Rotation: 66.82±5.041 and 67.2±4.861(p -Value: 0.702), Right Rotation: 67±4.949and 67±4.949 (p -Value :1) when compared.). As the cervical ROM were not affected in students with trapezitis in both the groups there was no significant difference in mean values of cervical ROM.

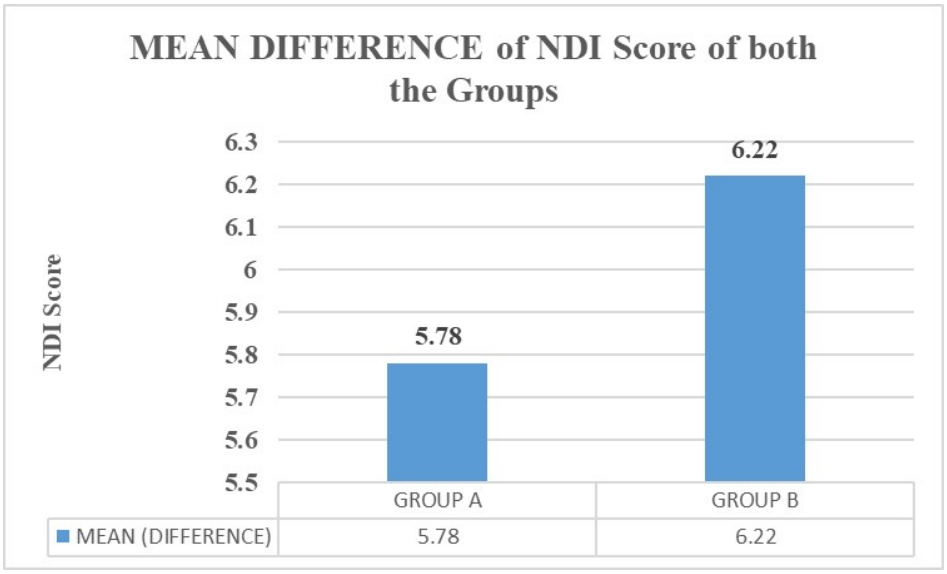
CROM	ROM	Mean (Difference)	SD	SEM	'p' value	't' value	Significance
Flexion	Group A	45.4	1.37	0.1938	1	0	Significant
	Group B	45.4	1.37	0.1938			
Extension	Group A	46.5	2.315	0.3273	0.838	-0.205	Not Significant
	Group B	46.6	2.564	0.3625			
Left Flexion	Group A	57.7	4.541	0.6422	0.692	0.397	Not Significant
	Group B	57.34	4.529	0.6405			
Right Flexion	Group A	57.9	4.414	0.6242	1	0	Significant
	Group B	57.7	4.854	0.6865			
Left Rotation	Group A	66.82	5.041	0.713	0.702	0.384	Not Significant
	Group B	67.2	4.861	0.6875			
Right Rotation	Group A	67	4.949	0.6999	1	0	Significant
	Group B	67	4.949	0.6999			



Graph 2: Comparison of mean cervical range of motion between Group A and Group B.

Table 3: Comparison of mean in post intervention between Group A and Group B using NDI questionnaire where t value is 0.513 and p value -0.66 which is statistically not significant, whereas within the groups it was significant.

NDI	Mean ±SD		't' value	'p' value	Result
	Pre	Post			
Group A	19.54 ± 6.553	5.78 ± 3.513	17.769	<0.0001	Extremely Significant
Group B	21.96 ± 8.471	6.22 ± 3.627	13.584	<0.0001	Extremely Significant
Group A v/s Group B	Group A Post	Group B Post	0.513	-0.66	Not Significant
	5.78 ± 3.513	6.22 ± 3.627			



Graph 3: Comparison of mean difference between Post NDI values between both the groups

DISCUSSION

The present study aimed at finding out the immediate effects of Myofascial Release Technique and Positional Release Technique in reducing pain on VAS scale and improving the cervical range of motion and NDI score in students with trapezitis. The results of the present study showed that myofascial release technique and positional release technique both are effective techniques for reducing pain and disability but as the baseline cervical ranges in both the groups were not affected so no significant difference was seen in post intervention cervical range of motions among college going students with trapezitis.

This finding was consistent with previous research done bySaiz - Llamosas, Jose R., and el al (2011) in which Myofascial release has been studied while examining ranges of motion pre and post treatment. One particular study was performed on a gaggle of asymptomatic adults. there have been 35 total subjects without a current history of neck pain. MFR was effective in improving cervical range of motion when compare with placebo treatment [20].

Likewise, another study of Hosseinifar M (2016) study found out the effect of MFR technique on chronic non-specific neck pain. It concluded that MFR is one of the effective manual therapy techniques in reducing pain and disability and improving the isometric extension strength of neck in patients with non-specific chronic neck pain [21]. Richard N and et al described that during PRT by placing the distress tissue into its most ease 'comfortable' position most of the pain free condition is developed. It evokes a therapeutically significant physiological response reduction in tension, nociceptive sensitivity, minimize the stimulation of the affected dysfunction [22]. Melzack and Wall (1998) [23] suggested the same thing that reduction in pain is due to mechanoreceptor

impulses resulting from applied pressure interfere with pain message (gate theory). Baldry (2013) stated that analgesic endorphin and encephalin are released in local tissue and brain [23]. This is in line with the study of Jone (1982) who suggested similar review that a minimum period required to hold a position of ease is 90 seconds in PRT, during this local circulation will improve due to release from the chronic sympathetic stimulation. The analgesic effect of positional release technique could be attributed to Bailey and Dick (1992) he proposed a nociceptive hypothesis that tissue damage in dysfunctional muscle can be reduced by the positional release mechanism. They suggested that relaxation of the damaged tissues may be achieved by placing patients in a position of ease which may advance local perfusion of fluids (i.e. blood and lymph) and enhance the removal of sensitizing inflammatory mediators [23].

Our results agreed with those of Meseguer et al., [23] who found that PRT was effective in reducing tenderness represented by an increase in pressure pain thresholds of trigger points in the upper trapezius muscle of subjects with mechanical neck pain. The application of PRT is thought to decrease tissue tenderness by altering nociceptor activity in the soft tissues. An increase in PPT is synonymous with a decrease in tissue sensitivity. Thus, the increase in PPT in response to PRT due to its analgesic effect of PRT. It is hypothesized by Weiselfish (1993) 133 that PRT apparently begins to engage the fascial tension patterns associated with trauma, inflammation, and adhesive pathology. A significant release response may be palpated during this phase and normalization of fascial tension.

As both the interventions given work majorly on two mechanisms which is stimulation of mechanoreceptors and post pressure increase in blood circulation and relaxes the muscles and eventually helps in reducing pain, improving cervical range of motion and reducing functional disability. Thus, probably this could be the reason for both the groups showing equal effectiveness.

Limitations of the study: The current study measures immediate effect of two different techniques with no follow-up. Sample size was limited. The treatment was applied for only one session thus, further studies should be conducted to test the effect of multi-sessions treatment and the long term follow up as well.

CONCLUSION

The present study concludes that MFR and PRT both are effective in reducing pain intensity on VAS scale and improving cervical ROM and reducing functional disability on NDI score. Hence rejecting the alternative hypothesis and accepting the null hypothesis. Thus the study concluded that there is no significant difference between MFR and PRT on pain, range of motion functional disability (NDI Score) trapezius.

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Conflicts of interest: None

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