

**[ORIGINAL ARTICLE]****Comparison Between the Effect of Positional Release Technique and Myofascial Release Technique on Upper Trapezius and Levator Scapulae Latent Trigger Points in Undergraduate Students**Dr. Lai Pathak<sup>1</sup>, Dr. Himanshu Mohan Pathak (PT)<sup>2</sup><sup>1</sup>Post Graduate Student , <sup>2</sup>Professor and HOD, CMF , College of Physiotherapy, Nigdi, Pune**ABSTRACT :**

**Background:** Many studies suggest that myofascial pain syndrome is an important source of musculoskeletal dysfunction. Also, on examining the trigger points, highest prevalence was seen in upper trapezius which was 94.79% followed by neck extensors 72.97% and levator scapulae 63.54%. Positional release technique and Myofascial release technique both have been used individually on both active and latent trigger points and have shown their effects on pain, functional disability and movement restriction. With considering the previous literature, aim of the study is to compare the effect of positional release technique and myofascial release technique on upper trapezius and levator scapulae latent trigger points in undergraduate students.

**Methodology:** 40 subjects fulfilling the inclusion and exclusion criteria were selected and randomly allocated into two groups via chit method. All the subjects were assessed for pain using VAS, neck disability using Neck Disability Index and cervical range of motion using goniometer before initiating the treatment. Group A was given Positional release technique along with conventional exercises of cervical movements and shoulder girdle exercises. Group B was given Myofascial release technique along with same conventional exercises.

**Result:** Data was collected and analysed. There was not a statistically significant difference when post scores of Group A and Group B were compared for pain, neck disability and cervical range of motion. On comparing the differences of scores of Group A and group B, statistically significant difference was seen only in cervical flexion range of motion ( $p < 0.0016$ ), cervical right rotation ( $p < 0.0002$ ) and left lateral flexion ( $p < 0.0062$ ) showing better results in Group A than Group B.

**Keywords:** Myofascial trigger points, Positional release technique, Myofascial release technique, Visual analog scale, Neck disability index.

**Introduction:**

During the past few decades, myofascial trigger points (MTrPs) and myofascial pain syndromes (MPS) have received much attention in the scientific and clinical literature.<sup>(1)</sup> Simons defined the myofascial trigger point (MTrP) as a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band.<sup>(2,3,4,5)</sup> The upper trapezius and levator scapulae muscle are designated as postural muscle and it is highly susceptible to overuse.<sup>(6,7)</sup> Also on examine the trigger points, highest prevalence was seen in upper

trapezius which was 94.79% followed by neck extensors 72.97% and levator scapulae 63.54%.<sup>(8)</sup> This study also mentioned that there was no significant difference in prevalence of active and latent trigger points among students.<sup>(9)</sup> Hence inferring from the studies, prevalence of latent TrPs are seen more common in levator scapulae and upper trapezius in undergraduate students as the sustained posture of sitting with head flexed has been adapted by the students, there is increase in activity by posterior neck muscles.<sup>(10)</sup> In treatment options for myofascial trigger points various studies have been

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conducted performing different techniques to reduce the pain intensity and presence of trigger points. PRT technique is easily tolerated by patient and can be used in situation where the pain levels are very high and movement or stretching of the muscle is not tolerated.<sup>(11)</sup> A Myofascial procedure ranges from prolonged stretching and soft tissue mobilization to subtle indirect techniques. Hence, this technique allows changes by stretching of the shortened structure working right from the skin till underlying tissue. Both the myofascial release technique and positional release technique are used for trigger points. They have shown to be effective in reducing pain and disability and also increasing in range of motion of affected region.<sup>(12)</sup> Studies done on myofascial trigger points, various manual techniques have been given in adjunct to both these techniques and also along with modalities like ultrasound, LASER, etc. have been used that showed conflicting result on one another.<sup>(13,14)</sup> Therefore, there is need to study the comparison of both MFR and PRT techniques without involving electrical modalities.

#### Materials and Methods:

Ethical clearance was taken from institution's ethical committee of CMF College of Physiotherapy, Pune.

#### Subjects:

Considering the data from previous study 13, with significance of 5% and power 80%, minimum sample size required is 19 in each group using WinPepi software. So, 40 Undergraduate students in age group of 19 to 25 years (both males & females) with Unilaterally present trigger points in upper trapezius and levator scapulae were selected for the study. 10 Subjects with Structural deformities like torticollis or scoliosis, Fracture of cervical vertebrae, Cervical Radiculopathy, Spondylolisthesis of the cervical spine 13 were excluded from the study.

Subjects were explained about the study prior to treatment and consent was taken. Duration of intervention was 2 weeks. Outcome measures were taken prior to the first session and after sixth session in 2nd week. Assessment of pain was taken by visual analogue scale. Assessment of neck disability was calculated using the NDI score. Subjects were asked to self-rate the components of the scale. Cervical range of motions included flexion, extension, lateral rotation and lateral flexion to both sides were measured actively using universal goniometer.

#### Procedure:

Positional release technique for upper trapezius trigger point.<sup>(11)</sup> - Patient position for treating trapezius trigger point: supine lying on a plinth with head in neutral position. The latent trigger point was palpated and pressure was applied. The head was laterally flexed to the affected side passively and Pressure was applied on trigger point till patient feels pain. Same side shoulder was taken into abduction, slight flexion and external rotation till the position of ease is felt. The position was held for 90 sec and then brought back to neutral. The whole procedure was repeated 3-4 times. Same technique was applied for six sessions in two weeks.

Positional release technique for levator scapulae trigger point<sup>11</sup> -The patient was in prone. The head was supported by the therapist's left hand holding the chin; left forearm was held along the right side of the patient's head for better support. The right-hand monitors tender points on the right side of the spinous processes. The forces applied were mostly extension, with slight side-bending and rotation to left. The position was held for 90 sec and then brought back to neutral. The whole procedure was repeated 3-4 times. Same technique was applied for six sessions in two weeks.



**Fig. 1:** Positional Release for upper trapezius trigger point



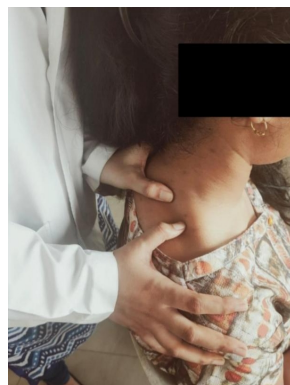
**Fig. 2:** Positional Release for levator scapulae trigger point

Group B subjects were given MFR for latent trigger points on upper trapezius and levator scapulae muscles.<sup>(15)</sup> The latent trigger point on trapezius was palpated. The fascia over it was stretched between two thumbs of therapist hands. The angle of stretch was kept at 30 degree of muscle fibers. One thumb was used as anchor and other slides in direction of stretch. The position was held for 10-15 seconds and then relieved. Total of 10 minutes of stretch was given with intermittent breaks to prevent erythema.

The latent trigger point on levator scapulae was palpated. The fascia over was stretched between two thumbs of therapist hands. The angle of stretch was kept at 30 degree of muscle fibers. One thumb was used as anchor and other slides in direction of stretch. The position was held for 10-15 seconds and then relieved. Total of 10 minutes of stretch was given with intermittent breaks to prevent erythema. Same dosage of treatment was given for six sessions in 2 weeks; 3 sessions per week.



**Fig.3:** MFR for Trapezius trigger point



**Fig. 4:** MFR for levator scapulae trigger point

This will be followed by conventional exercises like Shoulder girdle exercises: active – shoulder protraction, retraction, elevation and depression.

Cervical ROM exercise: flexion – extension, side to side rotation, lateral flexion both sides. Each exercise done for 10 repetitions with 5 second hold; twice a day daily for two weeks.<sup>(16)</sup>

**Results:**

Parametric tests such as t test (paired and unpaired) were applied for the data which was normally distributed. Non parametric tests like Mann Whitney U and Wilcoxon Signed Rank Test was applied for the data which was not normally distributed.

**Table 1:** Post Scores Difference for VAS In Group A and Group B

Group	Mean/SD	P value/dF
A	5.3/0.8013	0.2942/38
B	5/1.076	

**Inference:** The above table shows that Group A mean is 5.3 and SD is ±0.8013 and Group B mean is 5 and SD is ±1.076. The p value is 0.2942. This shows that there is no significant difference VAS in both the groups.

**Table 2:** Post Scores Difference for NDI in Group A and Group B

Group	Mean/SD	P value/dF
A	15.85/5.294	0.4736/38
B	16.95/4.261	

**Inference:** The above table shows that Group A mean is 15.85 and SD is ±5.294 and Group B mean is 16.95 and SD is ±4.261. The p value is 0.4736. This shows that there is no significant difference in NDI in both the groups.

**Table 3:** Post Scores for Difference Cervical Flexion in Group A and Group B

Group	Mean/SD	P value/dF
A	11.55/3.762	0.0016/38
B	7.4/3.966	

**Inference:** The above table shows that Group A mean is 11.55 and SD is ± 3.762 and Group B mean is 7.4 and SD is ±3.966. The p value is 0.0016. This shows that there is significant difference in Flexion range with group A showing better results than group B

**Table 4:** Post Scores Difference for Cervical Extension in Group A and Group B

Group	Mean/SD	P value/dF
A	7.95/2.114	0.1504/38
B	7.05/2.114	

**Inference:** The above table shows that Group A mean is 7.95 and SD is  $\pm 2.114$  and Group B mean is 7.05 and SD is  $\pm 2.114$ . The p value is 0.1504. This shows that there is no significant difference in Extension range between Group A and Group B.

**Table 5:** Post Scores for Cervical Right Rotation in Group A and Group B

Group	Mean/SD	P value/dF
A	27.05/5.463	0.0002/38
B	18.4/6.038	

**Inference:** The above table shows that Group A mean is 27.05 and SD is  $\pm 5.463$  and Group B mean is 18.4 and SD is  $\pm 6.038$ . The p value is 0.0002. This shows that there is significant difference in cervical right rotation range between the groups with Group A showing better results than Group B.

**Table 6:** Post Scores for Cervical Left Rotation in Group A and Group B

Group	Mean/SD	P value/dF
A	24.75/4.993	0.1325/38
B	22.15/5.354	

**Inference:** The above table shows that Group A mean is 24.75 and SD is  $\pm 4.993$  and Group B mean is 22.15 and SD is  $\pm 5.354$ . The p value is 0.1325. This shows that there is no significant difference in cervical left rotation range between the groups.

**Table 7:** Post Scores for Cervical Right Lateral Flexion in Group A and Group B

Group	Mean/SD	P value/dF
A	18.2/4.503	0.6453/38
B	17.15/4.511	

**Inference:** The above table shows that Group A mean is 18.2 and SD is  $\pm 4.503$  and Group B mean is 17.15 and SD is  $\pm 4.511$ . The p value is 0.6453. This shows that there no significant difference in cervical right lateral flexion range between the groups.

**Table 8:** Post Scores for Cervical Left Lateral Flexion in Group A and Group B

Group	Mean/SD	P value/dF
A	22.8/4.607	0.0062/38
B	18.7/4.330	

**Inference:** The above table shows that Group A mean is 22.8 and SD is  $\pm 4.607$  and Group B mean is 18.7 and SD is  $\pm 4.330$ . The p value is 0.0062. This shows that there is significant difference in cervical left lateral flexion range between the groups with group A showing better results than group B.

#### Discussion:

This study was carried to see the effect of Positional Release technique as compared to Myofascial release technique on myofascial trigger points on upper trapezius and levator scapulae in undergraduate students on pain, neck disability and cervical range of motion. When, the differences of scores were compared for both the techniques by VAS for reduction of pain, there was no significant difference seen. The p value calculated was 0.2942 which is not significant. Hence, both techniques proved to be equally effective for undergraduate students. Also, their ability to tolerate the techniques is high, any one of the techniques can be applied to reduce pain from trigger points in trapezius.

There is no statistical difference in Neck Disability Index score between PRT and MFR technique when applied on undergraduate students, the p value is 0.4736 which is not significant. Both the techniques proved to be equally effective for reducing neck disability. As the component of neck disability index included activities related to movement restrictions, sustained postures and pain intensity, the intensity of their affection has been reduced to lower levels due to resolution of pain caused by trigger point. As well as the restriction of surrounding tissue structures that had gone into contracted positions due to reflexive protective spasm is now relaxed because of counter-irritant effect or a spinal reflex mechanism of PRT and MFR techniques that produce reflex relaxation of the involved muscle, therefore, improving its ability to function.

While analysing between the groups differences of scores post treatment of group A and group B, the data for cervical flexion ( $p=0.0014$ ) and left lateral flexion ( $p$  value= $0.0062$ ) and cervical right rotation

(p value=0.0002), showing the difference to be statistically significant. Therefore, PRT proved to be better than MFR in increasing the cervical flexion, left lateral flexion and right rotation range of motion. As we see all these movement, puts the trapezius muscle in lengthened position, the flexibility is improved more better in PRT than in MFR. PRT is believed to achieve its benefits by means of an automatic resetting of muscle spindles, which would help to dictate the length and tone into the affected tissues and increase the length of Sarcomeres in contraction knot area. In addition, the results came in agreement with those reported by Mohamed et al., 2014, who examined the effect of myofascial therapy treatments using PRT on chronic mechanical low back pain showing that PRT reduced pain and improved lumbar range of motion.<sup>(17)</sup>

Also, in a study by Reema Joshi, reported that PRT acts on the muscle spindle mechanism and its associated reflex mechanism that helps to controls spasm by promoting a more normal firing of the spindle and more normal level of tension in the muscle. Reduction in localized spasm increase range of motion, decrease pain allows normal circulation and improves lymph drainage and increases the potential for more normal biomechanics.<sup>(18)</sup>

Considering the above-mentioned studies, we can say the PRT benefits the entire muscle by reducing its tension as well as resolving the trigger point. These changes are seen more evidently in the undergraduate students as they lie in the age group of<sup>(19-25)</sup>.

The rest of ranges for cervical range of motion did not show any difference between the groups as the p value for extension table 4(0.1504), left rotation table 6(0.1325) and right lateral flexion table 7(0.6453) shows no significant difference. Hence both the techniques were equally effective for those ranges.

Hence, we can conclude that even though both the techniques target the myofascial trigger point and shows significant improvement to pain and neck disability, the cervical range of motion are better improved in positional release technique.

#### **Conclusion:**

This study concludes that both the techniques PRT and MFR are equally effective in reducing pain and neck disability for myofascial trigger points present in upper trapezius and levator scapulae. Cervical range of motion specifically cervical flexion, cervical right rotation and cervical left lateral flexion was

better improved in positional release technique than in myofascial release technique of latent trigger points,

#### **Limitations:**

1. Only right-side trigger points with same hand dominance were studied.
2. Long term effects of both the techniques were not assessed.
3. Consideration whether student is full time studying or just attending regular classes was not taken.
4. There was uneven distribution of males and females

#### **Future scope of study:**

1. Use for PRT in studies to increase flexibility with flexibility outcome measures can be assessed.
2. Long term effects of individual techniques can be studied
3. Same comparison can be done to different muscle or group of muscles
4. Variations of PRT and MFR techniques can be used for trigger points release

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**Conflict of Interest:** None

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