

# Comparison Of Muscle Energy Technique Vs Positional Release Technique For Pain Relief In Upper Trapezius Trigger Point

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**Abstract- Background:** Upper trapezius myofascial trigger point (MTrPt) is most common musculoskeletal disorder which leads to neck pain. Due to carrying heavy weight of bags and poor posture during reading, Student population is very prone to suffer from trapezius MTrPt. Early prevention is very crucial to prevent further musculoskeletal disorders. Muscle Energy Technique (MET) and Positional Release Technique (PRT) are one of the many manual techniques to treat MTrPt. **Objectives:** To see the effect of MET and PRT in relieving pain in upper trapezius MTrPt. **Materials and methods:** In this study 48 students with upper trapezius MTrPt were included (age 18-35). These were divided into group-A (MET and conservative treatment) group-B (PRT and conservative treatment) and group-C (conservative treatment) all groups underwent treatment for 2 weeks, 3 session per week. Post measurements were taken immediately, after 1 week and 2 weeks. **Results:** there was statistically significant improvement in Range Of Motion, pressure pain threshold and Neck Disability Index for both MET and PRT group. **Conclusion:** PRT shows more improvement compared to MET in treating upper trapezius trigger points

**Keywords-** muscle energy technique, positional release technique, upper trapezius, trigger point.

## I. INTRODUCTION

Myofascial trigger points are hyperirritable spots in a tight band of skeletal muscles. <sup>[1]</sup> They are formed with misaligned posture and injury to the fibres. <sup>[2]</sup> The injured fibres have less removal of metabolites along with less nutrients availability. <sup>[3]</sup> Upper trapezius is an overused postural muscle. This results in high prevalence of trigger point within upper trapezius. <sup>[4]</sup>

An active trigger point produces characteristic referred pain and is very painful on palpation. With latent showing all the features of active trigger point but to a minor degree. <sup>[5]</sup> Functionally these trigger points limits neck range and daily activities. <sup>[6]</sup>

Muscle energy technique (MET) is a manual technique that involves voluntary contraction of subject's muscle in controlled way, against therapist's counterforce. MET may be used to decrease pain, reduce tone of muscle, improve local circulation, stretch tight muscles and fascia along with strengthening weak muscles and mobilizing joint restrictions. <sup>[7]</sup>

Positional release technique (PRT) is a soft tissue technique to reset muscle tone and increase circulation. <sup>[8]</sup> Here the muscle is positioned in position of greatest comfort with the application of pressure until painful response is produced. At pain ease position, tone reduces. <sup>[9]</sup>

Different studies have shown the effectiveness of various manual therapy techniques for treating MTrPt in various muscles by reducing pain. Studies comparing various manual therapy techniques for trigger points are less. There have been no studies done to compare the effectiveness of MET and PRT. MET and PRT both are effective techniques for treating trigger points. So, this study aims to compare the effectiveness of these techniques in upper trapezius trigger point.

## II. METHODOLOGY

It was an experimental study design carried out at D.Y. Patil College of Physiotherapy. The sample size was 48. The sampling method was simple random sampling. Students between ages 18-35 years with upper trapezius trigger points, non- radiating and non- articular pain were included in the study. Whereas, students with signs of serious pathology (e.g. malignancy, infection, inflammatory disorder, or fracture), history of cervical spine surgery, any recent neck traumatic/pathological fractures or injuries, any signs of cervical spinal cord compromise (e.g. diffuse sensory abnormality, diffuse weakness, hyperreflexia, or the presence of clonus) and patients with psychological problems were excluded from the study.

A pre-treatment assessment was done which included the subjects with upper trapezius trigger point that was confirmed by a pincer palpation test, which elicits jump sign. After that pressure pain threshold was measured with the help of pressure algometer, range of motion of cervical spine was measured using a half circle universal goniometer and subjects were asked to fill the neck disability index questionnaire and the score was documented.

The students were randomly allocated to 3 groups with the help of chit method. Group A received MET+ conventional therapy, group B received PRT+ conventional therapy and group C received conventional therapy (stretching of upper trapezius, neck isometrics). Treatment was given for 2 weeks; 3 sessions per week; each session was approximately 5 minutes long including rest period. Post measurements had been taken immediately, at the end of the 3<sup>rd</sup> session and 6<sup>th</sup> session, using pressure algometer for pain, goniometer for ROM and NDI for functional ability.

### III. STATISTICAL ANALYSIS

The data analysis was done by using SPSS version 16 software. Sapiro – wilk test was applied on all the data's pre and post values to know if the data was normally distributed. As the data was not normally distributed, Kruskal Wallis was done for comparison of pre and post values between 3 groups. Freidman's test was done for comparison of pre and post values within the group.

### IV. RESULTS

The mean value of PPT, ROM and NDI among the groups taken before, immediately after, after 3<sup>rd</sup> session and 6<sup>th</sup> session does not show any statistically significant difference. Whereas, the mean value of PPT and NDI taken before, immediately after, after 3<sup>rd</sup> session and 6<sup>th</sup> session within the group shows highly significant statistical difference within all groups as the P value is 0.001. The mean values of ROM taken before, immediately after, after 3<sup>rd</sup> session and 6<sup>th</sup> session shows no statistical significant difference in flexion and extension ROM within the groups as the P value is >0.005. Whereas, there is highly significant difference seen in right and left lateral flexion and rotations within the groups as the P value is >0.001.

### V. DISCUSSION

The result of the current study shows effectiveness in both the techniques by increasing the pressure pain tolerance of the muscle. However, there is no statistical difference in pressure pain threshold among all 3 groups i.e. MET, PRT and

control group, taken immediately after the treatment, after 3<sup>rd</sup> session and after 6<sup>th</sup> session and the P Values are 0.07, 0.06 and 0.10 for right upper trapezius muscle and 0.1, 0.4 and 0.38 for left upper trapezius muscle respectively. This shows that MET and PRT are equally effective in relieving the pain of the trigger points in upper trapezius muscle.

PRT technique puts the muscle in various position of ease, a state of relaxation. This relaxation of tensioned muscle fibres along with the ischemic compression improves the local blood supply of the muscle that was compromised in the contracted state. Same helps in removal of the metabolites and chemical mediators with the better nutrition and oxygen supply.<sup>[10]</sup>

MET is patient active muscle contraction technique given in several manner using isometric contraction or reciprocal relaxation. It helps to relieve acute or chronic muscle spasm and also to mobilize restricted joints. This technique has a physiological effect on central and peripheral modulatory mechanisms as analgesics. It activates muscle and joint mechanoreceptors which sends signals via large sensory fibres carrying cutaneous sensory inputs which inhibits pain transmission carried by the small pain fibres. This process results in relaxation of muscle. Additionally, MET may increase fluid drainage from the local area and increases hypoalgesia. Rhythmic muscle contraction results in improvement in muscle blood and lymph flow rates. The mechanical forces acting on fibroblasts and in connective tissues stimulates increase in trans capillary blood flow. MET may decrease pro-inflammatory cytokines and inhibits peripheral nociceptors. This results in reduction of pain.<sup>[11]</sup>

In passive stretching when muscle lengthens, the muscle spindle is stretched and its nerve activities increases. This results in increased alpha motor neuron activity causing the muscle fibres to contract. A secondary group of neurons causes the opposing group of muscle to relax. This increases in muscle length which leads to increase in joint range of motion.<sup>[12]</sup>

PRT targets at removing restrictive barriers of movement in the body by reducing protective muscle spasm, joint hypo mobility facial tension, pain, and swelling and improves circulation and strength. As a result the patient begins to move the muscle more easily and with less pain and discomfort. This results in improvement in ROM.<sup>[10, 11, 12]</sup> The result of this study are found similar to the previous study done in (2014).<sup>[18]</sup> In which they had found that PRT and passive stretching combined was more effective than passive stretching alone in patients with trapezititis.

MET includes stretching of the muscle which leads to the lengthening of sarcomere where trigger point are formed due to contraction of sarcomere in the affected muscle fibres so therefore by lengthening of muscle fibre it decrease the pain secondly tissue relaxation created by passive stretching and MET in combination facilitating ‘reduction of tone in the tissues involved. Previous study showed similar results on improvement of ROM after MET.<sup>[14]</sup> A study done in (2013) showed similar results.<sup>[19]</sup>

The upper trapezius muscle facilitates in cervical movement of lateral flexion and rotation. Which could help in decrease of pain and lengthening of upper trapezius muscle fibre, which could lead to improve in ROM which is why the study shows significant improvement in lateral flexion. However upper trapezius muscle does not play a significant role during cervical flexion and extension movement, which could be why there is no statistical difference in ROM of flexion and extension of cervical spine.

The result of this study showed improvement in NDI in all the groups. However, there is no statistically significant difference between these two techniques. As the patient had improvement in PPT and increase in ROM of cervical spine the patient’s quality of life increased, which is why patient showed improvement in NDI.

**VI. CONCLUSION**

MET and PRT techniques both are found to be an effective techniques for treating the trigger points of upper trapezius muscle.

MET and PRT techniques are effective for reducing pain and improving the pressure pain tolerance, improving the ROM and NDI score of the patient.

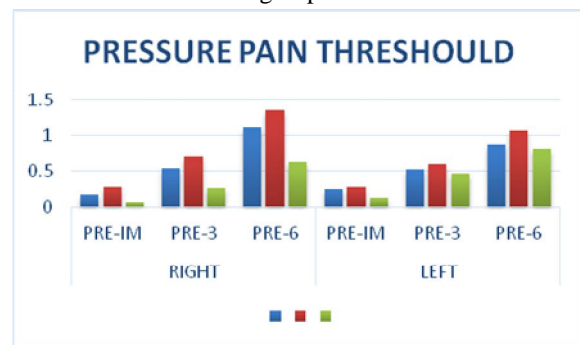
However, the PRT technique proved to be more effective in reducing pain of the trigger point, improving the ROM and the NDI score as compared to MET and conventional treatment only.

**VII. APPENDIX**

**Table 1:** Mean values of PPT among the groups.

		PRESSURE PAIN THRESHOLD					
		RIGHT			LEFT		
		PRE-IM	PRE-3	PRE-6	PRE-IM	PRE-3	PRE-6
MET	Mean (SD)	0.17(0.29)	0.34(0.38)	1.11(0.63)	0.23(0.22)	0.33(0.42)	0.87(0.91)
PRT	Mean (SD)	0.28(0.29)	0.71(0.57)	1.36(1.20)	0.28(0.36)	0.61(0.51)	1.07(0.72)
CONT ROL	Mean (SD)	0.06(0.08)	0.26(0.35)	0.63(0.56)	0.13(0.30)	0.47(0.70)	0.82(0.97)
P value		0.07	0.06	0.10	0.1	0.4	0.38

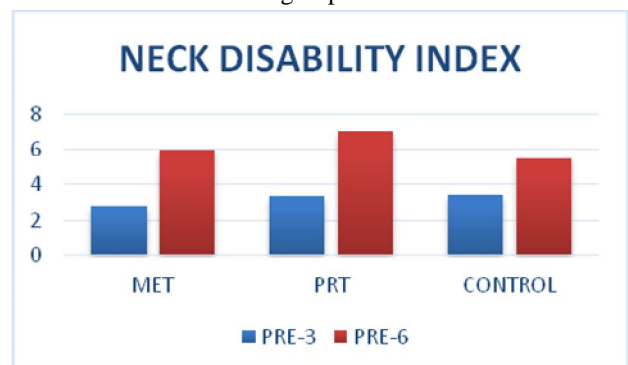
**Graph 1:** Difference between mean values of PPT among the groups.



**Table 2:** Mean values of NDI among the groups.

		NECK DISABILITY INDEX	
		PRE-3	PRE-6
MET	Mean(SD)	2.81(2.86)	6.0(4.30)
PRT	Mean(SD)	3.33(3.35)	7.05(5.14)
CONTROL	Mean(SD)	3.45(4.30)	5.45(4.39)
P value		0.73	0.84

**Graph 2:** Difference between mean values of NDI among the groups.



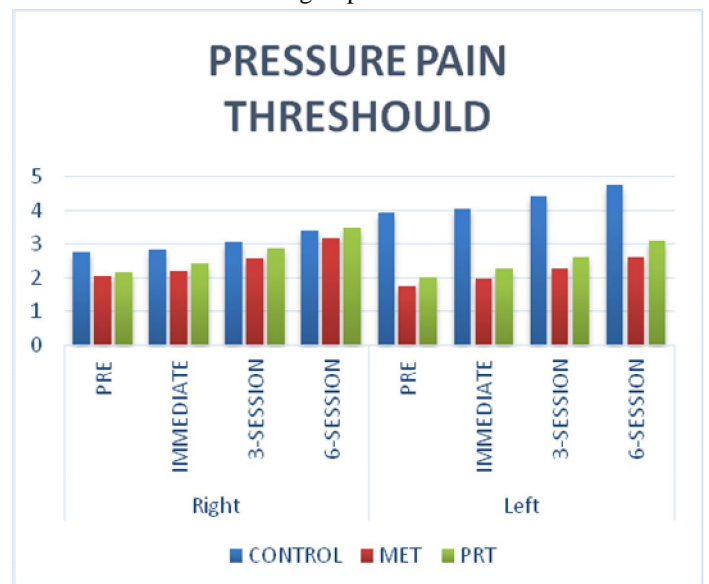
**Table 3: Mean values of ROM among the groups.**

			RANGE OF MOTION		
			PRE-IM	PRE-3	PRE-6
FLEXION	MET	Mean (SD)	0.48(2.18)	0.48(2.18)	1.43(4.78)
	PRT	Mean (SD)	0.95(3.01)	0.95(3.01)	1.43(3.58)
	CONTROL	Mean (SD)	0	0	0
	P value			0.53	0.53
EXTENSION	MET	Mean (SD)	0.48(2.18)	1.90(5.12)	2.86(5.61)
	PRT	Mean (SD)	0	0	1.43(4.79)
	CONTROL	Mean (SD)	0	0.45(1.51)	0.45(1.51)
	P value			0.45	0.36
RIGHT FLEXION	MET	Mean (SD)	0.48(2.18)	2.14(3.73)	3.33(4.56)
	PRT	Mean (SD)	2.86(4.63)	3.81(4.72)	4.28(4.82)
	CONTROL	Mean (SD)	0.45(1.51)	1.36(3.23)	2.27(4.1)
	P value			0.17	0.2
LEFT FLEXION	MET	Mean (SD)	0.71(3.27)	1.90(4.02)	3.57(4.22)
	PRT	Mean (SD)	2.38(4.07)	2.62(4.07)	4.05(5.83)
	CONTROL	Mean (SD)	0.45(1.51)	1.36(3.23)	3.18(5.13)
	P value			0.16	0.66
RIGHT ROTATION	MET	Mean (SD)	0.24(1.09)	0.48(3.5)	2.62(6.04)
	PRT	Mean (SD)	3.33(4.83)	4.76(7.15)	5.71(6.94)
	CONTROL	Mean (SD)	0	0.45(1.51)	0.91(3.01)
	P value			0.19	0.2
LEFT ROTATION	MET	Mean (SD)	1.19(3.5)	1.90(4.02)	3.33(5.99)
	PRT	Mean (SD)	1.90(4.02)	5.24(7.15)	5.95(7.35)
	CONTROL	Mean (SD)	0.45(1.51)	2.27(6.07)	2.27(6.07)
	P value			0.72	0.22

**Table 4: Mean values of PPT within the group.**

		PRESSURE PAIN THRESHOLD							
		Right				Left			
		PRE	IMMEDIATE	3-SESSION	6-SESSION	PRE	IMMEDIATE	3-SESSION	6-SESSION
CONTROL	Mean (SD)	2.76 (2.08)	2.83 (2.13)	3.03 (2.27)	3.39 (2.43)	3.93 (2.43)	4.05 (2.64)	4.40 (2.85)	4.75 (2.95)
	P value	0.001				0.001			
MET	Mean (SD)	2.04 (0.86)	2.20 (0.85)	2.58 (1.06)	3.15 (1.29)	1.74 (0.9)	1.99 (1.06)	2.28 (1.29)	2.61 (1.58)
	P value	0.001				0.001			
PRT	Mean (SD)	2.14 (1.42)	2.43 (1.55)	2.86 (1.86)	3.50 (2.45)	2.0 (1.14)	2.28 (1.41)	2.61 (1.52)	3.07 (1.74)
	P value	0.001				0.001			

**Graph 4: Difference between mean values of PPT within the groups.**



**Table 5: Mean values of ROM within the groups.**

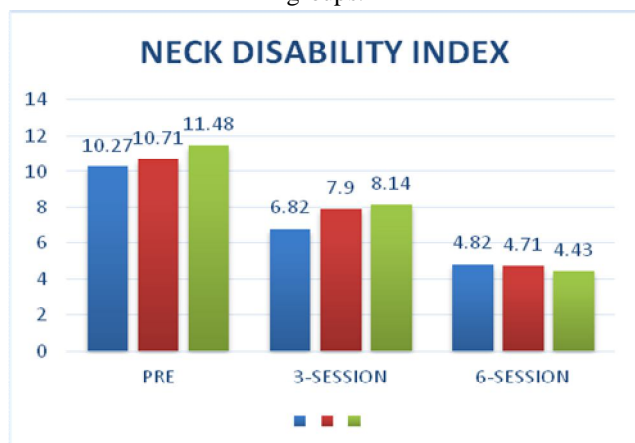
			PRE	IMMEDIATE	3-SESSION	6-SESSION
FLEXION	CONTROL	Mean (SD)	45.45(5.22)	45.45(5.22)	45.45(5.22)	45.45(5.22)
		P Value	0.35			
	MET	Mean (SD)	42.86(8.45)	43.33(7.30)	43.33(7.30)	44.28(5.98)
		P Value	0.145			
	PRT	Mean (SD)	47.14(6.44)	48.09(6.01)	48.09(6.01)	48.57(5.73)
		P Value	0.096			
EXTENSION	CONTROL	Mean (SD)	55.45(6.87)	55.45(6.87)	55.90(5.84)	55.90(5.84)
		P Value	0.392			
	MET	Mean (SD)	51.43(9.64)	51.90(8.73)	53.33(7.30)	54.28(6.76)
		P Value	0.008			
	PRT	Mean (SD)	54.28(7.46)	54.28(7.46)	54.28(7.46)	55.71(5.98)
		P Value	0.194			
RIGHT FLEXION	CONTROL	Mean (SD)	33.18(6.43)	33.64(7.10)	34.54(5.68)	35.45(6.50)
		P Value	0.067			
	MET	Mean (SD)	34.52(6.69)	35.0(6.71)	36.67(6.39)	37.86(5.61)
		P Value	0.001			
	PRT	Mean (SD)	34.28(5.54)	37.14(5.60)	38.09(4.60)	38.57(4.51)
		P Value	0.001			
LEFT FLEXION	CONTROL	Mean (SD)	34.54(4.72)	35.0(5.0)	35.91(5.84)	37.73(6.07)
		P Value	0.02			
	MET	Mean (SD)	33.33(5.99)	34.04(6.04)	35.24(5.80)	36.90(5.12)
		P Value	0.001			
	PRT	Mean (SD)	34.28(7.29)	36.67(5.77)	36.90(5.58)	38.33(4.56)
		P Value	0.001			
RIGHT	CONT	Mean	84.54(8.54)	84.54(8.54)	85.0(7.85)	85.45(8.54)

ROTATION	ROL	(SD)	8.20)	20)	.41)	6.87)
ROTATION	MET	P Value	0.392			
		Mean (SD)	85.48(7.23)	85.24(7.33)	85.95(5.15)	88.09(3.70)
	PRT	P Value	0.009			
		Mean (SD)	80.71(8.84)	84.04(7.52)	85.48(7.73)	86.43(5.95)
	CONTROL	P Value	0.001			
		Mean (SD)	84.09(10.20)	84.54(9.07)	86.36(7.77)	86.36(7.77)
LEFT ROTATION	MET	P Value	0.194			
		Mean (SD)	83.81(7.40)	85.0(7.58)	85.71(6.18)	87.14(5.14)
	PRT	P Value	0.022			
		Mean (SD)	82.38(7.84)	84.28(6.18)	87.62(3.75)	88.33(3.29)
	CONTROL	P Value	0.001			
		Mean (SD)	84.09(10.20)	84.54(9.07)	86.36(7.77)	86.36(7.77)

**Table 6: Mean values for NDI within the groups.**

			PRE	3-SESSION	6-SESSION
CONTROL	Mean(SD)	10.27(5.68)	6.82(3.99)	4.82(3.34)	
	P value	0.005			
MET	Mean(SD)	10.71(3.82)	7.90(3.78)	4.71(4.32)	
	P value	0.001			
PRT	Mean(SD)	11.48(7.91)	8.14(6.92)	4.43(4.84)	
	P value	0.001			

**Graph 6:** Difference between mean values of NDI within the groups.



### REFERENCES

- [1] Nipa shah. Neha shah. Comparison of two treatment techniques: muscle energy technique and ischemic compression on upper trapezius trigger point in subjects with non-specific neck pain. IJTRR 2015, 4:5 doi: 10.5455/ijtrr.00000100
- [2] Mense S, simon DG, Russel IJ. Muscle pain: understanding its nature, diagnosis, and treatment: lippincott williams and wilkins; 2001
- [3] Newman DIL. Myofascial pain and dysfunction: the trigger point manual; the lower extremities. The clinical journal of pain. 1992;8(2):178
- [4] A.Kumaresan, G.Deepthi, Vaiyapuri anandh, S.Pratap. effectiveness of positional release therapy in treatment of trapezitis. International journal of pharmaceutical science and health care. 2012;1(2): 71-81.
- [5] Gerwin RD: classification, epidemiology, and natural history of myofascial pain syndrome. Curr pain headache rep 2001, 5:412-420.
- [6] Harden RN, Bruehl SP, gass S, Niemiec C, barbick B. signs and symptoms of the myofascial pain syndrome: a national survey of pain management providers. The clinical journal of pain. 2000;16(1):64-72.
- [7] Greenman PE. Principles of manual medicine. 3<sup>rd</sup> ed. Baltimore: lippincott williams and wilkins;2003.
- [8] Christopher kevin wong. Strain counter strain: current concept and clinical evidence manual therapy. 2012;17(1):2-8.
- [9] Amit V Nagrale, paul glynn, aakanksha Joshi and Gopichand Ramteke. The efficacy of an integrated neuromuscular inhibition technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomised controlled trial. Journal of manual and manipulative therapy. 2010;18 (1):37-43.
- [10] Kerry j. D' Ambrogio, George b. Roth. Positional Release Therapy. 1st ed; 1997.
- [11] Lawrence H. Jones, DO. Jones Strain Counter strain. 2nd ed; 1995.
- [12] Janet D Travell, David G Simons. Myofascial Pain and Dysfunction: The Trigger point Manual. Volumes 1 (Upper Body). 2nd ed; 1983
- [13] José Saavedra F. Cordeiro M. Alves J. Fernandes H. Reis V. Mont'Alverne D. The influence of positional release therapy on the myofascial tension of the upper trapezius muscle. RBCDH.
- [14] Fritz S. Fryer G. Crenshaw K. Liebenson C. Porterfield R. Shaw N. et al. Advanced soft tissue techniques Leon Chaitow Muscle Energy Techniques, 3<sup>rd</sup> edition. Churchill Livingstone, 2006, pp.8-10.
- [15] Mehdikhani R. Okhovatian F. Immediate effect of muscle energy technique of latent trigger point of upper trapezius muscle. Elsevier. Clinical Chiropractic (2012) 15, 112—120.
- [16] Amit V Nagrale, Paul Glynn, Aakanksha Joshi, and Gopichand Ramteke. The efficacy of an Integrated Neuromuscular Inhibition Technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomized controlled trial. Journal of Manual & Manipulative Therapy. 2010; 18 (1):37-43
- [17] D' Ambrogio KJ, Roth GB, Robertson J, Halperin S, Wiley M. Positional release therapy: assessment and treatment of musculoskeletal dysfunction. Mosby, 1997
- [18] Carvalho s. Vinod K. Sai N. Ayyappan r. Effect of positional release technique in subjects with subacute trapezitis. IJPHY. Vol 1 (2), 91-99, 2014.
- [19] Noor R, Bashir M, Afzal B. Comparative Study of Treatment of Trigger Points Pain With Two Techniques .1 Muscle Energy Technique Alone 2. Combined Approach. IJSR ISSN (Online): 2319-7064.