

# EFFECTIVENESS OF DRY NEEDLING OVER ULTRASOUND THERAPY IN CASE OF MYOFASCIAL PAIN SYNDROME OF TRAPEZIUS MUSCLE OF CENTRAL TYPE

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### Abstract:

### **Objective:**

The main aim of this study was to compare the effectiveness of dry needling over ultrasound therapy in case of trigger point in the trapezius muscle of central type (Myofascial pain syndrome).

#### Design:

Total 60 patients were randomly assigned to an dry needling(n=30) and ultrasound (n=30) groups. The primary outcome measures were the visual analogue scale (VAS) and NPRS before and at the end of two weeks treatment program.

#### **Result:**

The paired t-test was used to compare the pre-versus post treatment results of group A and group B separately. In the analysis and interpretation of visual analogue scale between group a and group B. Unpaired t-test was post-test of group\_

Keywords: Myofascial pain syndrome, Trigger points, Dry needling, Hyper irritable spot, Microtrauma.

#### Introduction:

Musculoskeletal pain is significant and common medical condition up to 85% of the general population will experience. At least one episode of musculoskeletal pain during their lifetime. it develops in the myofascia, mainly in the centre of a muscle belly where the motor end plate enters. Myofscial pain syndrome is a common painful muscle disorder caused by myofascial trigger point. Trigger point (TrP) is defined as a hyperirritable



spot within a taut band of skeletal muscle fascia, which produces pain on compression at a target and around the surrounding structures. These palpable nodules are present within the tight muscle at the size of 2-10 mm and can demonstrate at different places in any skeletal muscle of the body. Referred pain is an important characteristics of a trigger point. it differentiates a trigger point from a tender point, which is associated with pain at the site of palpation only.

Many researchers agree that acute trauma or repetitive microtrauma may lead to the development of a trigger point.eg of predisposing activities include holding a telephone receiver between the ear and shoulder to free arms, prolonged ending over a table, sitting on chair with poor back support, improper height of arm rest. Pain caused by trigger point is due to hypoxia and decreased blood flow within the trigger point. This leads to decreased pH which activates the muscle nociceptors to restore homeostasis. This causes peripheral sensitization. trigger points are also involved in central sensitization. The mechanism remains unclear but trigger point maintains nociceptive input in to the dorsal horn and therefore contribute to central sensitization.



**Review of Literature:** 

**D.N.S.V Ramesh et.al (2020)** stated that TENS as well as therapeutic ultrasound offers clinicians an excellent entry point to modify patient's acute and chronic pain problems. As proven in our study ultrasound is a step higher than TENS in pain alleviation and hence can be relied by dentists for soothing and targeting a pain free ambiance for the patient.

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**Razaeian, tahere PhD,PT et.al (2020)** the application of dry needling technique caused an improvement in symptoms of migraine patients. the finding of this study suggest that headache parameters, PPT of sternocledomastoid muscle and active cervical range of motion may be in a direct relation with decreased muscle thickness of sternocledomastoid muscle thus, this technique may be prescribed for treatment of migraine patients with MTrp in the sternocledomastoid muscle.

Anjum Fatima sheikh, N.P Singh (2020) The conventional therapy may be useful therapeutic modalities in the reduction of pain severity, although the result revealed that conventional therapy has a statistically significant reduction in pain but dry needling therapy showed more significant reduction in pain. Thus, dry needling therapy should be combined with other modalities to gain better results in the treatment of low back ache among power lifters.

**Chomkajee sukareechi et.al (2019)** dry needling and radial shock wave therapies are effective in reducing myofascial pain syndrome originating in the upper back muscle. Participants pain pressure threshold increased after 3 weeks of treatment with both therapies. Radial shock Wave therapy can be use as an alternative to dry needling in the treatment of myofascial pain syndrome in patients who have trouble attending daily physical therapy or in whom dry needling therapy is contraindicated.

Zishta patel, Ankit Srivastava, Ashok Shyam, Parag Sancheti (2019) stated that dry needlin is more effective than ultra sound for reducing pain and increasing functional outcome in patients with patella femoral pain syndrome both groups achieved improvement in the system but dry needling group had better improvement in the symptoms than the ultra sound group.

**Cesar Fernandez-de-las-penas, jo nijs (2019)** this narrative review presents current perspective on the clinical application of trigger point dry needling for management of chronic pain. Current evidence, mostly experimental studies, supports a possible role of myofascial trigger points in relation to be excitability of the central nervous system. The application of trigger point dry needling is able to reduce his excitability by reducing dorsal horn neuron activity, and by modulating brainstem areas. However, effects are only seen at short-term and effect sizes are small, pointing to a particular role that trigger point play within the complex chronic pain experience.

**Javed sarrafzadeh et.al ( 2018)** superficial dry needling has the same therapeutic effects as deep dry needling in the short term to make long – term changes, the superficial dry needling method is not effective. Therefore, even if the treatment initially begins with superficial dry needling, it should be continued with deep dry needling. The deep dry needling method has better effects in the short and long terms than the superficial. However, this does not reduce the importance of the superficial dry needling applications.



**Rastyslav Bubnov V and jun wang (2017)** this study concluded that ultra sound guidance significantly increase the pain relief effect. Increase the level of eliciting LTR, and significant decreased the average number of needled trigger points and the average number of treatment sessions. This approach can be utilized further to address musculoskeletal pain and neuromuscular disease.

**Lynn H. gerber et al.(2017)** in this study ,there was sustained reduction of pain scores after completion of dry needling which is more likely with a greater drop in VAS score patients with higher baseline VAS score are less likely to respond to dry needling. early intervention toward significant pain reduction is likely to be associated with sustained clinical respond.

**Xia P et.al (2017)** the current evidence suggest that there may be a significant effect of ultrasound therapy on pain in myofascial pain syndrome patients but not on range of motion. The high risk of bias makes the effects of ultrasound on pain and range of motion inconclusive. The relevant evidence is extremely weak, due to the very low quality of some students, incompleteness of patient reported outcomes, and very small sample sizes, nevertheless the effects of ultrasound therapy on myofascial pain syndrome should be confirmed by large-sized and high quality RCTs that have safe gaurds against bias and assess important outcomes.

**Eric gattie, PT, BPT et.al (2017)** based on the GRADE approach, low to moderate quality from studies in a variety of musculoskeletal conditions strongly suggests that dry needling performed by physical therapists is more effective than no treatment or sham dry needling for reducing pain, improving PPT, and improving functional outcomes in the immediate to 12 weeks follow up period.

**Boyles Robert, Rebecia Fowler, Derek Ramsay et al. (2015)** stated that majority of high quality studies included in this review show measured benefit from dry needling for multiple trigger points in multiple body areas, suggesting broad applicability of dry needling treatment for multiple muscle groups.

James dunning et.al (2014) several studies have demonstrate immediate or short term improvements in pain and disability by targeting trigger point using in and out techniques such as 'pistoning' or 'sparrow pecking'. However, to date, no high quality, long term trials supporting in and out needling technique at exclusively muscular trigger point exist, and the practice should therefore be questioned. The insertion of dry needling in to asymptomatic body areas proximal and/or distal to the primary source of pain is supported by the myofascial pain syndrome literature.

**Rostyslav v bubnov MD PhD and Jun Wang (2013)** stated that this study provides evidence supporting that ultrasound imaging is an effective and necessary modality in myofascial pain treatment. it suggest the potential role of imaging guidance in the standardization of evidence based diagnostic methods for TrP - DN.



### **Objective of the study:**

- ✤ To identify the patients with primary trigger points of trapezius muscle at definite pain level.
- To assess the effects of therapies (dry needling and ultrasound therapy) and improvement in pain of trigger point of trapezius muscle and compare the efficacy.

Methodology study design:

A pre-test comparative analysis design based on cross-sectional study will be included for the collection of data.

### **Grouping & Sample Size**

The patients will be selected as subject, after screening from Physiotherapy OPD of University Institute of Health Sciences, Chhatrapati Sahu ji Maharaj University, Kanpur for treatment. Total 60 patients will be selected as per inclusion & exclusion criteria. Period of study was 6 months

There will be two groups of patients:

1) Group A- The subjects will receive dry needling therapy for 15 days.

Total No. of subjects- 30

2) Group B- The subjects will receive ultrasound therapy for 15 days.

Total No. of subjects- 30

### Data analysis:

Data analysis was done using IBMSPSS statistics (software package used for statistical analysis). Descriptive statistics was done to determine the demographic characteristics of the subjects recruited in this study

Total consent of participation= 60.

Total successful participants= 60.

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Total unsuccessful participants=00.

## STATISTICAL TOOL:

### **1.PAIRED 't' TEST:**

To calculate the parameter we will use the following formula:

$$t = \frac{\overline{d}}{\sqrt{s^2/n}}$$

where

'd bar' is the mean difference between two samples

 $S^2$  is the sample variance,

n is the sample size and

t is a paired sample t – test with n-1 degrees of freedom.

An alternate formula for paired sample t-test is:

$$t = \frac{\frac{\sum d}{\sqrt{n(\sum d^{2}) - (\sum d)^{2}}}}{n-1}$$

#### 2. UNPAIRED 't' TEST:

The test is used only when it can be assumed that the two distributions have the same variance. (when this assumption is violated, see below.) the t statistic to test whether the means are different can be calculated as follows:

$$t = \frac{X_1 - X_2}{Sx_1 x_2 \cdot \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where

$$Sx_1x_2 = \frac{\sqrt{(n_1 - 1)S^2 X_1 + (n_2 - 1)S^2 X_2}}{n_1 + n_2 - 2}$$



Note that the formulae above are generalizations of the case where both samples have equal sizes ( substitute n for  $n_1$  and  $n_2$ ).

 $Sx_1x_2$  is an estimator of the common standard deviation of the two samples: it is defined in this way so that its square is an unbiased estimator of the common variance whether or not the population means are the same.

In these formulae.

n = number of participants.

1 = group one , 2 = group two.

N-1 is the number of degrees of freedom for either group, and

The total sample size minus two ( that is,  $n_1 + n_2 - 2$  ) is the total number of degrees of freedom, which is used in significance testing.

### **DATA PRESENTATION**

**TABLE 1.** The comparative mean value, mean difference, standard deviation and paired t- values between pretest and post- test of VAS for pain in Group A.

S. NO	TEST	MEAN	MEAN	STANDARD	PAIRED t VALUE
			DIFFERENCE	DEVIATION	& P VALUE
1.	PRE-	7.20			27.643
	TEST				
			5.4	1.070	P=0.001
2.	POST-	1.80			
	TEST				

**TABLE 2.** The comparative mean value, mean difference, standard deviation and paired t- values between pretest and post- test of NPRS for pain in Group A.



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			MEAN	STANDARD	PAIRED t-	VALUE
S NO	TEST	MEAN	DIFFERENCE	DEVIATION	& P VALUE	
5.10	1L51					
1.	PRE- TEST	7.87			32.743	
			6.07	1.015	P= 0.001	
2.	POST-	1.80				
	TEST					

**TABLE 3.** The comparative mean value, mean difference, standard deviation and paired t- values between pretest and post-test for VAS for pain in Group B.

S. NO	TEST	MEAN	MEAN DIFFERENCE	STANDARD DEVIATION	PAIRED T-VALUES & P VALUE
1.	PRE-TEST	7.60	3.77	1.007	20.502
2.	POST-TEST	3.83		1.006	P=0.001

**TABLE 4.** The comparative mean value, mean difference, standard deviation and paired t- values between pretest and post- test of NPRS for pain in Group B.

S.NO	TEST	MEAN	MEAN DIFFERENCE	STANDARD DEVIATION	PAIRED t- VALUE & P VALUE
1.	PRE – TEST	7.53	3.56	0. 774	25.244 P= 0.001



**TABLE 5.** The comparative mean value, mean difference, standard deviation and unpaired 't' values of VAS & NPRS between Group A and Group B.

OUTCOME	ANALYSIS	GROUP	MEAN	t VALUE	P VALUE
	PRE	А	7.20	- 1.258	.213
	PRE	В	7.60		
VAS	POST	А	1.80	- 6.568	0.001
	POST	В	3.83		
	PRE	А	7.87	1.306	.197
NPRS	PRE	В	7.53		
	POST	А	1.80	- 10.418	0.001
	POST	В	3.97		

#### **Conclusion:**

- Trigger point must be considered an aetiology for pain. Treatment of trigger points is a good alternative when other conservative treatment Have failed. Dry needling is a relatively safe and simple treatment modality.
- This study shows that there was reduced pain statistically in trigger points pain of trapezius muscle patient after the treatment with dry needling than with ultrasound therapy having myofascial pain syndrome in trapezius muscle. Thus, the study concluded that dry needling was an effective treatment for trigger



points pain and visual analogue scale and numerical pain rating scale could be used as the assessment tools for trigger points pain patient.

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