ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 10 | October - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON OF THE EFFECTIVENESS BETWEEN DRY NEEDLING AND DRY NEEDLING WITH INTRAMUSCULAR ELECTRICAL STIMULATION ON MYOFASCIAL PAIN SYNDROME.

Physiotherapy & Rehabilitation

Singh Kapil — Master of Physiotherapy (Orthopedics), Gurugram University, Gurugram (Haryana).

Dhull Tarun — Assistant Professor (MPT Sports), Department of Physiotherapy, Gurugram University, Gurugram (Haryana).

Goyal Antim* — Master of Physiotherapy (Orthopedics), Gurugram University, Gurugram (Haryana). *Corresponding Author

Sharma Bharti — Assistant Professor (MPT Neurology), Department of Physiotherapy, Gurugram University, Gurugram (Haryana).

ABSTRACT

Background: Myofascial pain syndrome is defined as the pain derived from myofascial trigger points which are hyperirritable nodules located within a tout band of muscle. **Objectives:** To compare the effectiveness between dry needling and dry needling with intramuscular electrical stimulation in Myofascial pain syndrome. **METHODS:** Thirty subjects who were diagnosed with Myofascial pain syndrome at our outpatient department were randomly assigned in two groups dry needling (n=15) and Dry needling with intramuscular electrical stimulation (n=15). We include patients of 18-30 years of age. Measure was taken pre and post treatment in each group. Both groups were compared together. These measures include NPRS for pain score and Range of motion and patient satisfaction. **Results:** Fifteen patients from dry needling and fifteen patients dry needling with intramuscular electrical stimulation the follow up period. Comparison of the post treatment result in dry needling with Intramuscular electrical stimulation groups showed that NPRS was significant then in dry needling alone. While NPRS was significant improved in dry needling with Intramuscular electrical stimulation. But improvement of NPRS in the dry needling was non-significant. **Conclusion:** Dry needling still has some positive results yet. Dry needling with Intramuscular electrical stimulation was associated with rapid pain relief and patient satisfaction and was proved to be practical for treatment of Myofascial pain syndrome.

KEYWORDS

Dry needling, Myofascial pain syndrome, NPRS, Range of motion.

INTRODUCTION:

Myofascial pain syndrome (MPS) is a common and characteristic musculoskeletal disorder that causes chronic pain in several parts of the body [1]. MPS is defined as the pain derived from myofascial trigger points [1,2], which are hyperirritable nodules located within a tout band of muscle. These are often thought to be caused by motor endplate dysfunction, in addition to biochemical and vascular change that led to MPS [2]. Which are usually extremely tender on palpation. Pain may refer to distant area may be accompanied by sensory disturbance and autonomic phenomenon [3]. A trigger point is painful point within muscle contracture or taut band in muscle belly, which is aggravated by a directly applied force, pressure, contraction, or stretching [4]. Tout band is a palpable rope-like hardening of muscle bearing a Myofascial Trigger Point (MTrP) [6]. A trigger point can cause limited Range of Motion (ROM), referred pain, reduced functional ability or weakness, stiffness, motor dysfunction [4]. MTrPs found in one or more muscle and connective tissue [5]. Trigger points may be active or latent. Active trigger point cause spontaneous pain and may lead to satellite trigger point formation whereas latent ones are asymptomatic unless palpated firmly. Latent trigger point can develop into active ones as a result of psychological stress, poor posture, sudden injury, muscle overload, repetitive micro trauma [3]. About one third of the patient with musculoskeletal complaint diagnostic criteria for MPS [6]. Most common muscles for the trigger point are infraspinatus and teres minor muscle. The trigger point in these muscles is accompanied with many disorders. The MTrP in these muscles are common condition among patients with shoulder complaint, neck pain. [6,7]

MTrP and MPS have been treated with several therapeutic modalities including therapeutic ultrasound, ischemic compression techniques, stretching, manipulation, dry needling. Dry Needling (DN) consists of using a needle as a physical agent to create a mechanical stimulus with the goal of deactivating the trigger point. It is an invasive procedure, where the needle is inserted through the skin and muscle into the MTrP. It is cheap, easy to learn and with low risks associated [5]. DN is one of the standard interventions, to achieve pain relief, muscle relaxation and increase range of motion. IMES is a minimally invasive electrotherapeutic method used to deliver impulse into the muscle for achieving therapeutic benefits such as pain relief, movement re-education, relaxation [7]. High frequency 50-100 pulses per second to inhibit sensory nerves and motor nerves, relieves spasm of the muscles and blood vessels and pain relief. Low frequency 2-5 pulses per second induce the contraction of muscles and enhance the tension of the muscles and ligaments, reduce paralysis and injury of the muscles [8]. Multiple studies have investigated the effect of dry needling on pain sensitivity in patients with shoulder pain and found it decreases immediately after one week treatment [9]. One of these studies also reported concurrent immediate changes in range of motion of shoulder and pain after dry needling.

Several investigations have reported that IMES can be an effective modality on musculoskeletal pain. However, few relevant studies could be found which reported effect of the IMES on myofascial trigger points [10]. Several researchers were done the study of myofascial pain syndrome, but there is lack of study that shows comparison of the effectiveness between DN and DN/IMES on MPS on infraspinatus and teres minor muscles. This study will help in evaluating a better physiotherapy treatment intervention in case of MPS. It will also aid new dimension of treatment for MPS and it will also motivate many researchers for study in MPS with musculoskeletal association. It could be help younger generation to get right information and treatment of MPS.

Research Methodology:

Study design:
This study was a Comparative experimental study design and approved by the institutional Review Board of Gurugram University.

Study area:
The study was conducted in the Department of Physiotherapy, Gurugram University, Gurugram Haryana

Study Period:
The study was conducted from May 2022 to July 2022

Sample size & Sampling technique:
A prior sample size was calculated based on pain severity using minimal clinical important difference (MCID). The sample size estimation was performed by formula. It was estimated from the sample size calculation that 30 participant and they were randomly divided into two groups. Group 1(n=15) participants was Dry needling and Group 2 (n=15) participants was Dry needling with Intramuscular electrical stimulation.

All participants provided written informed consent prior to their enrollment in this study and their rights remain protected throughout

the study. It was emphasized that their participation in this study was purely voluntary basis and they were free to withdraw at any point of time during study period and there were no administrative consequences for their withdrawal from the study.

Inclusion Criteria:
- Age 18-30.
- Both male and female.
- Active trigger points located in one or both infraspinatus and teres minor.
- Participant who was willing to participant in the study.
- Pain was scored between 0 to 8.

Exclusion Criteria
- Earlier shoulder surgeries.
- Shoulder pain with neurological symptoms.
- Shoulder trauma.
- Dermatological infections.
- Radiating pain from neck to full upper extremity.

Data collection procedure:
The study was done to check the effectiveness between dry needling and dry needling with intramuscular electrical stimulation on myofascial pain syndrome. 30 subjects in the study were distributed randomly into two groups i.e., Group A who received DN and Group B those who received DN/IMES. They all have similar baseline values suggesting that both groups had a homogenous distribution. NPRS and Range of motion of shoulder were recorded before giving the intervention.

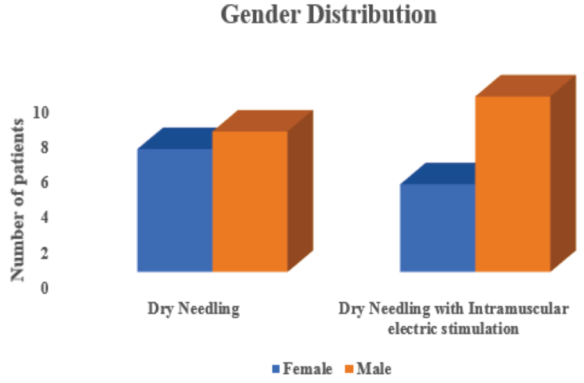
The participant in the group a performed DN in 2 sessions per week. Group B performed DN/IMES in 2 sessions per week for 3 weeks. The post data was calculated on end of 3rd week. Result revealed that both the group showed improvement, however significant improvement was noted in group B. DN/IMES reduced the score of NPRS and improved range of motion of shoulder. In group B, treatment was found to be more effective than the participants of group A who received only DN.

Data analysis
The data were collected and entered in Microsoft excel sheet and were analyzed using statistical package for social science (SPSS) version 23. Data within each group were analyzed using a Wilcoxon signed ranked test looking at change from baseline to 3 weeks. Baseline values were compared between the two groups, using a Wilcoxon signed ranked test.

RESULTS:

Table.1. Distribution of intramuscular electrical stimulation with and without dry needling according to gender

	Dry Needling	Dry Needling with Intramuscular electrical stimulation
Female	7 (47.0%)	5(33.0%)
Male	8 (53.0%)	10(67.0%)



In the present study, there were 30 participants included in our study, in which 15-15 subjects were divided into two groups. In table 1 and figure 1.1 shows the dry needling group, there were 47% of females and 53% were males. However, in dry needling with intramuscular electrical stimulation group, the males were almost 67% and remaining 33% were females.

Table.2. Distribution of dry needling parameters according to pre and post intervention

Dry Needling	Pre	Post	z-value	p-value
NPRS				
Median (IQR)	6 (7-4)	4(6-3)	-2.627	0.009*
Range (Max-Min)	4(8-4)	6(8-2)		
Shoulder Abduction				
Median (IQR)	3(4-3)	4(4-3)	-2.449	0.015*
Range (Max-Min)	2(4-2)	1(4-3)		
Shoulder External Rotation				
Median (IQR)	2(3-2)	3(3-3)	-2.236	0.025*
Range (Max-Min)	1(3-2)	1(3-2)		

IQR- Interquartile Range; Max- Maximum value; Min-Minimum Value;
***- Significant at 0.05 level of significance.**
According to table.2. it depicts the comparison of pre and post intervention in DN group, the NPRS scale used for pain score, the median value for pretest, it was found to be 6 and after intervention it was reduced to 4, Wilcoxon signed ranked test was applied and the results were significant at 0.05 level of significance.

Similarly for Shoulder Abduction movement, it was again significant at 0.05 level of significance with pretest mean value was 4 and post was 6.

For Shoulder External Rotation, the pretest score was found to be 2 with calculated median and post was 3, Z-value was calculated using Wilcoxon signed rank test and it was calculated as -2.24 and the results were significant at 0.05 level of significance.

Table.3. Distribution of dry needling with intramuscular electrical stimulation parameters according to pre and post intervention

Dry Needling with Intramuscular electrical stimulation	Pre	Post	z-value	p-value
NPRS				
Median (IQR)	5(7-4)	2(2-1)	-3.446	0.001**
Range (Max-Min)	5(8-3)	3(3-0)		
Shoulder Abduction				
Median (IQR)	3(4-3)	4(4-4)	-2.810	0.005**
Range (Max-Min)	2(4-2)	1(4-3)		
Shoulder External Rotation				
Median (IQR)	2(3-1)	3(3-3)	-2.889	0.004**
Range (Max-Min)	2(3-1)	1(3-2)		

IQR- Interquartile Range; Max- Maximum value; Min-Minimum Value;
****- Significant at 0.01 level of significance.**
According to table.3. it reveals the comparison of pre and post intervention in DN/IMES group, the NPRS scale median value for pretest was found to be 5 and after intervention it was comes at 2, Wilcoxon signed ranked test was applied and the results were significant at 0.01 level of significance.

For Shoulder Abduction movement, the median value at pretest was 3 and after intervention it was going to 4. The result was significant at 0.01 level of significance. Similarly for Shoulder External Rotation movement, the pretest score was carried out to be 2 median and after intervention, it was 3 with 3-3 IQR, Z-value was calculated using Wilcoxon signed rank test as -2.889 and the results were significant at 0.01 level of significance.

DISCUSSION:
The current study provided evidence of reduction of pain and improve function with use Of DN/IMES. Similar findings were found in the study conducted by Kindlye Brennan et al (2021) [2]. Another study conducted by Jodie M. Rock et al (2014) [11] found that with the use of DN and IES, immediate reduction in pain and free ROM was improved.

In our study we found that DN was less effective than DN/IMES for the treatment of pain caused due to MPS. Similar findings were found in the study conducted by Juan Rodriguez-Mansilla et al (2016) [12] that DN was less effective on reducing pain caused by MPS after 3-4 weeks.

In our study, we found that DN/IMES and DN significantly improved

range of motion of shoulder external rotation and abduction. Similar findings were found in the study conducted by Sukumar Shanmugam et al (2021) [7].

CONCLUSION:

The study concluded that Dry needling with intramuscular electrical stimulation was more effective than Dry needling in reducing pain with more patient satisfaction, myofascial trigger points deactivation and improving the external rotation and abduction range of motion of shoulder. We suggest that dry needling with intramuscular electrical stimulation to manage the signs and symptoms of Myofascial pain syndrome in regular clinical practice.

REFERENCES:

1. Ibrahim, D. A., & Abdelrahem, H. A. (2019). Cervical region trigger point Injection with dry needling versus wet needling by lidocaine in geriatric population: a comparative study. *Ain-Shams Journal of Anesthesiology*, *11*(1), 1-6.
2. Brennan, K., Elifritz, K. M., Comire, M. M., & Jupiter, D. C. (2021). Rate and maintenance of improvement of myofascial pain with dry needling alone vs. dry needling with intramuscular stimulation: a randomized controlled trial. *Journal of Manual & Manipulative Therapy*, *29*(4), 216-226.
3. Taşoğlu, Ö., Şahin Onat, Ş., Bölük, H., Taşoğlu, İ., & Özgirgin, N. (2017). Comparison of two different dry-needling techniques in the treatment of myofascial pain syndrome. *Agri*, *29*(1), 9-
4. Hadizadeh, M., Rahimi, A., Javaherian, M., Velayati, M., & Dommerholt, J. (2021). The efficacy of intramuscular stimulation in the management of patients with myofascial pain syndrome: a systematic review. *Chiropractic & manual therapies*, *29*(1), 1-14.
5. Espejo-Antúnez, L., Tejeda, J. F. H., Albornoz-Cabello, M., Rodriguez-Mansilla, J., de la Cruz-Torres, B., Ribeiro, F., & Silva, A. G. (2017). Dry needling in the management of myofascial trigger points: a systematic review of randomized controlled trials. *Complementary therapies in medicine*, *33*, 46-57.
6. Hadizadeh, M., Tajali, S. B., Moghadam, B. A., Jalaie, S., & Bazzaz, M. (2017). Effects of intramuscular stimulation on symptoms following trigger points; a controlled pilot study. *Journal of Modern Rehabilitation*, *11*(1), 31-36.
7. Shanmugam, S., Mathias, L., Manickaraj, N., Kumar, K. D., Kandakurti, P. K., Dorairaj, S. K., & Muthukrishnan, R. (2021). Intramuscular stimulation combined with therapeutic exercises in patients with shoulder adhesive capsulitis: a randomised controlled trial. *International Journal of Surgery Protocols*, *25*(1),
8. Clewley, D., Flynn, T. W., & Koppenhaver, S. (2014). Trigger point dry needling as an adjunct treatment for a patient with adhesive capsulitis of the shoulder. *journal of orthopaedic & sports physical therapy*, *44*(2), 92-101.
9. Koppenhaver, S., Embry, R., Ciccarello, J., Waltrip, J., Pike, R., Walker, M., ... & Flynn, T. (2016). Effects of dry needling to the symptomatic versus control shoulder in patients with unilateral subacromial pain syndrome. *Manual therapy*, *26*, 62-69.
10. Tejera-Falcón, E., Toledo-Martel, N. D. C., Sosa-Medina, F. M., Santana-Gonzalez, F., Quintana-de la Fe, M. D. P., Gallego-Izquierdo, T., & Pecos-Martín, D. (2017). Dry needling in a manual physiotherapy and therapeutic exercise protocol for patients with chronic mechanical shoulder pain of unspecific origin: a protocol for a randomized control trial. *BMC Musculoskeletal Disorders*, *18*(1), 1-11.
11. Rock, J. M., & Rainey, C. E. (2014). Treatment of nonspecific thoracic spine pain with trigger point dry needling and intramuscular electrical stimulation: a case series. *International journal of sports physical therapy*, *9*(5), 699.
12. Rodríguez-Mansilla, J., González-Sánchez, B., García, Á. D. T., Valera-Donoso, E., Garrido-Ardila, E. M., Jiménez-Palomares, M., & López-Arza, M. V. G. (2016). Effectiveness of dry needling on reducing pain intensity in patients with myofascial pain syndrome: a Meta-analysis. *Journal of Traditional Chinese Medicine*, *36*(1), 1-13.