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# TRIGGER POINT INJECTION IN MYOFASCIAL PAIN SYNDROME - A RANDOMISED CONTROL TRIAL

Medical Science

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## ABSTRACT

**Background**: Myofascial Pain Syndrome is collection of sensory, motor and autonomic symptoms that include local and referred pain, decreased range of motion and weakness.

**Objective** : To compare outcome of physical therapy alone and physical therapy with trigger point injection in management of Myofascial Pain Syndrome.

**Methodology**: This prospective randomised control study was performed in a tertiary care teaching institution of North India. Age and sex matched, subjects with myofascial pain syndrome were enrolled in this study. Subjects were assessed by cervical ROM parameters, Numerical Pain Rating Scale and Pressure Pain Threshold at 3rd day, 1week and 4th week.

**Results**: 60 patients were included in this study with mean age group of 25.93+4.65yrs and 26.60+4.99 yrs respectively, and median of 22 yrs and 23 yrs in control and intervention group respectively. The female: male ratio was 1.5:1 and 1.3:1 respectively. Using CF, CE, NPRS and PPT as outcome parameters, were 39.00±6.49, 32.40±2.49, 8.60±0.62, and 1.00±0.00respectively which improved for 66.17±4.09, 67.33±3.65, 1.17±0.65, 5.00±0.00, respectively at 4th week of trigger point injection.

**Conclusion**: Combined approach of trigger point injection with physical therapy is more effective and safe for be administered in outpatient as very good alternative for oral drugs and physical therapy alone.

## KEYWORDS

### Introduction

Myofascial pain syndrome (MPS) is characterized by regional pain originating from hyperirritable spots located within taut bands of skeletal muscle, known as myofascial trigger points (MTrPs). Common etiologies of myofascial pain and dysfunction may be from direct or indirect trauma, spine pathology, exposure to cumulative and repetitive strain, postural dysfunction, and physical deconditioning. Symptoms of MFPS include regional pain in the neck, shoulders, upper extremities, face, low back and lower limb, referred pain, burning sensation, tenderness of the involved muscle, poor sleep, swelling, fatigue, paraesthesia, decreased range of motion at the joints which the muscle crosses, weakness of certain movements, muscular imbalances, secondary depression and sleep disturbances. Differential diagnosis of MFPS include tension headaches, migraine and cluster headaches, low back syndromes, pelvic pain, Intermittent claudication, Bursitis, arthritis and tendinosis. Essential Diagnostic Criteria for TrPs include a tender point within a taut band of skeletal muscle, patient's recognition of current pain complaint by pressure on the tender nodule (identifies active TrP), painful limit to full passive stretch range of motion, visual or tactile identification of local twitch response, observation of a local twitch response induced by needle penetration of a tender nodule, Pain or altered sensation (in the distribution expected from a TrP in that muscle) on compression of a tender nodule. Treating the underlying etiology is currently the most widely accepted strategy. If the root cause is not properly treated, MTrPs may reactivate and MPS may persist. Nonsteroidal anti-inflammatory drugs (NSAIDs) are the most commonly used. A diclofenac patch for myofascial pain of the trapezius muscle is found with statistically significant benefits. Cyclooxygenase-2 (COX-2) inhibitors have relatively more-tolerable side-effect profile. Tramadol, a centrally acting mu-receptor agonist is an effective and well-tolerated agent. Tropisetron is recently used as an analgesic with limited commercial availability. Opioids are not normally indicated in the treatment for MPS. Although weak opioids are moderately effective, most studies do not support them. Lidocaine patches had statistically significant increase in pain thresholds and general activity. Muscle relaxants like Tizanidine, benzodiazepines like clonazepam, Cyclobenzaprine, Thiocolchicoside and anticonvulsants like Gabapentin or Pregablin has no established role as per Cochrane literature review. Antidepressants like tricyclics, duloxetine and sumatriptan are indicated for chronic pain. Other Commonly used Noninvasive methods include Spray and stretch technique (which involve application of vapo-coolant spray while applying stretch to the shortened muscle), Ischemic compression and stretch, , Transverse friction massage, acupressure, shiatsu type of massage and Myofascial release technique (MRT). Invasive techniques include Dryneedling (hypodermic needle or acupuncture needle is inserted into the TrP and repeatedly punctured by withdrawing and re inserting) and Trigger point injections (a hypodermic needle is inserted with normal saline or local anesthetic with or without steroids).

### AIMS AND OBJECTIVES

The aim of this study is to compare the effect of physical therapy alone and with trigger point injections in patients of myofascial pain syndrome. The outcome measures used are cervical spine ROM, Numeric Pain Rating Scale (NPRS) and Pressure Pain Threshold (PPT). The objective is to compare the overall outcome at 4th week and to determine if there is any difference in outcome at different time intervals (at 3rd day, 7th day and 4th week).

### MATERIAL AND METHODS

60 patients were randomized based on computer generated random number of tables coming to or admitted in our department due to myofascial pain syndrome from October 2017 to february2018. 40 were treated with conventional physical therapy while 40 were given additional single dose of trigger point injection using 0.5ml 0f 0.5% bupivacaine and 0.5ml 40mg methylprednisolone. Outcome were assessed by cervical flexion, extension, Numeric Pain rating scale (NPRS) and Pressure Pain Threshold9PPT) at 3rd day, 1 week and 4th week. Patients included in this study were having 18 to 45 years of age with chronic dull aching pain associated with muscle and soft tissue tenderness, pain related to position or movement of muscle or

pain associated with acute overload or chronic overuse of muscle, patients with regional pain in neck, shoulders, upper extremities, face, lower back and lower limbs, referred muscle pain with burning sensation or tenderness of involved muscle, regional or muscular pain associated with poor sleep, swelling, fatigue, paraesthesia and decreased ROM at joints which the muscle crosses and patient willing to take participate in the study, take injection and regular follow up visit as directed. The exclusion criteria served to eliminate subjects with an inappropriate diagnosis of MFPS and subjects with inappropriate medical conditions complicating the pathology or management .

## RESULTS

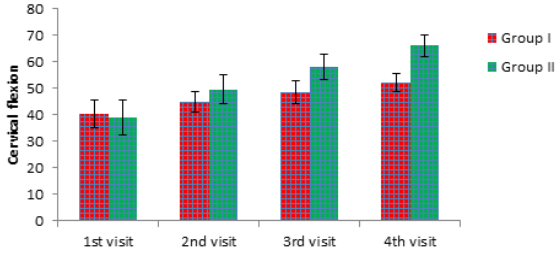
The age of Group 1 and Group 2 patients ranged from 17-40 yrs and `18-38 yrs respectively with mean (± SD) 25.93±4.65 yrs and 26.60±4.99 yrs respectively,. Comparing the mean age of two groups, Student's t test showed similar age between the groups i.e. did not differ significantly. Comparing the sex proportions (M/F) of two groups, $\chi^2$ test showed similar sex proportions between the groups ($\chi^2$=0.05, p=0.820) i.e. also not differed significantly. Comparing the mean cervical flexion within the groups showed significant (p<0.001) increase (improvement) in cervical flexion at Visit 2 and Visit 3 as compared to Visit 1 in both groups. It is also increased (improved) significantly (p<0.001) at Visit 3 as compared to Visit 2 in both groups. At final evaluation, the net mean improvement (i.e. mean change from Visit 1 to Visit 3) in cervical flexion of Group 2 was found higher as compared to Group 1(graph 1.1). Comparing the mean cervical extension within the groups, showed significant (p<0.001) increase in cervical extension at Visit 2 and Visit 3 as compared to Visit 1 in both groups. Further, in both groups, the mean cervical extension also increased significantly (p<0.001) at Visit 3 as compared to Visit 2. At final evaluation, the net mean improvement (i.e. mean change from Visit 1 to Visit 3) in cervical extension of Group 2 was found higher as compared to Group 1(graph 1.2). Comparing the mean Numeric Pain Rating Scale (NPRS) within the groups showed significant (p<0.001) decrease in NPRS at Visit 2 and Visit 3 as compared to Visit 1 in both groups. At final evaluation, the net mean decrease (i.e. mean change from Visit 1 to Visit 3) in NPRS of Group 2 was found higher as compared to Group 1(graph 1.3). . Comparing the mean PPT score within the groups, showed significant (p<0.001) decrease in PPT score at Visit 2 and Visit 3 as compared to Visit 1 in both groups. However, at both Visit 2 and Visit 3, it was significantly (p<0.001) different and lower in Group 2 as compared to Group 1. Moreover, at final evaluation, the net mean improvement (i.e. mean change from Visit 1 to Visit 3) in PPT score of Group 2 was found higher than Group 1(graph1.4).

## DISCUSSION

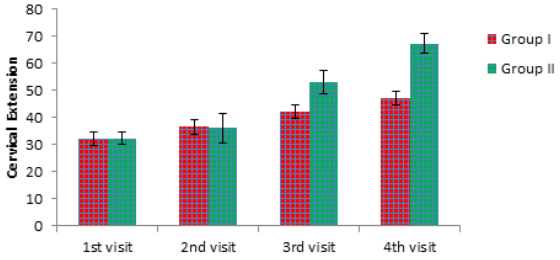
Myofascial pain syndrome (MPS) is characterized by regional pain originating from hyperirritable spots located within taut bands of skeletal muscle, known as myofascial trigger points (MTrPs). Common aetiologies of myofascial pain and dysfunction may be from direct or indirect trauma, spine pathology, exposure to cumulative and repetitive strain, postural dysfunction, and physical deconditioning **Mehul J. Desai at al in 2013** in their review study on management of myofascial pain syndrome concluded that pharmacologic treatments like, tizanidine, benzodiazepines, tropisetron and topical diclofenac and lidocaine patches have limited efficacy and of the modalities reviewed, dry needling and trigger point injections are the mainstay of interventional treatment. This is consistent with the result of present study. **Saime Ay et al in their study in 2010** compared the efficacy of local anaesthetic injection and dry needling methods on pain, cervical ROM, and depression in MPS. In their study, 80 patients were assigned into two groups. Group 1 received local anaesthetic injection (2 ml lidocaine of 1%) Group 2 received stretching exercises.. There were significant improvements in VAS, cervical ROM, and BDI scores after 4 and 12 weeks in both groups compared to pre-treatment results ($p <$ 0.05). Their study indicated that exercise associated with local anaesthetic and dry needling injections were effective in decrease of pain, depressive mood and increase of cervical ROM. The present study also shows better results in combination of injection with physical therapy. **Corrie L. Graboski , D. Shaun Gray, Robert S. Burnham** in their study in 2005 compared the effectiveness of trigger point injections using BTX A versus bupivacaine, both in combination with a home-based rehabilitation program, in treatment of MFPS. Both treatments were effective in reducing pain when compared to baseline ($P$=0.0067). No significant difference was found the two groups. Considering the high cost of BTX A, bupivacaine is deemed a more cost-effective injectate for MPS. **Cummings TM and White MR in their study in 2001** over needling therapies in the management of MFPS pain concluded that direct needling appears to be an effective treatment, but the hypothesis that needling therapies have efficacy beyond placebo is neither supported nor refuted by the evidence from clinical trials. **Han Stephanie C. B.S.; Harrison, Patricia M.D. in their study in 1997** concluded that a multidisciplinary approach to treatment of myofascial pain syndrome appears to be most beneficial and may include such modalities as trigger-point injections, dry needling, stretch and spray, and transcutaneous electrical nerve stimulation.

## CONCLUSION

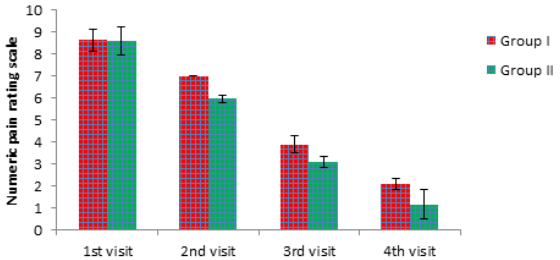
Combined approach of trigger point injection with local anaesthic with steroid and physical therapy proved to accelerate the recovery of MFPS. This combined approach is effective and safe to be administered in outpatient clinics by a well-trained physician, offering clear advantages (ease of application, low cost, rare side effects) and considering that the top priority of a pain control program is restoration of function to perform usual ADL. It may prove to be a useful treatment for patients who are unfit or unwilling to drugs for very long period. Further, there are economic benefits as patients are able to return to work sooner without the need for hospitalization or spending time in physical therapy sessions.



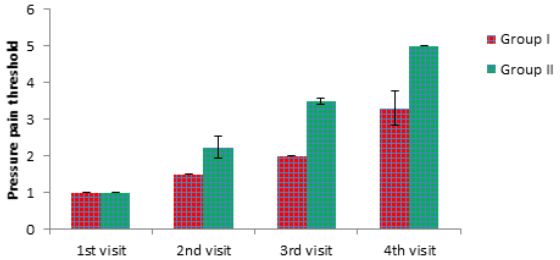

**Graph 1.1**




**Graph 1.2**




**Graph 1.3**




**Graph 1.4**

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