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Muscle pain treated with injected normal saline solution

Pain comes in all shapes and sizes. Ranging from acute to chronic, from nociceptive and myofascial to neuropathic, pain is a part of life. Myofascial or muscle pain, is among the most common. With a lifetime prevalence of up to 85%, it affects nearly all of us at some point in our lives. This type of pain does not represent a threat to life or limb. However, does pose a substantial threat to the quality of life. Myofascial pain is commonly the result of trauma and repetitive muscle stress, but can also result from malnutrition, poor posture, and even poor sleep hygiene, to name a few.

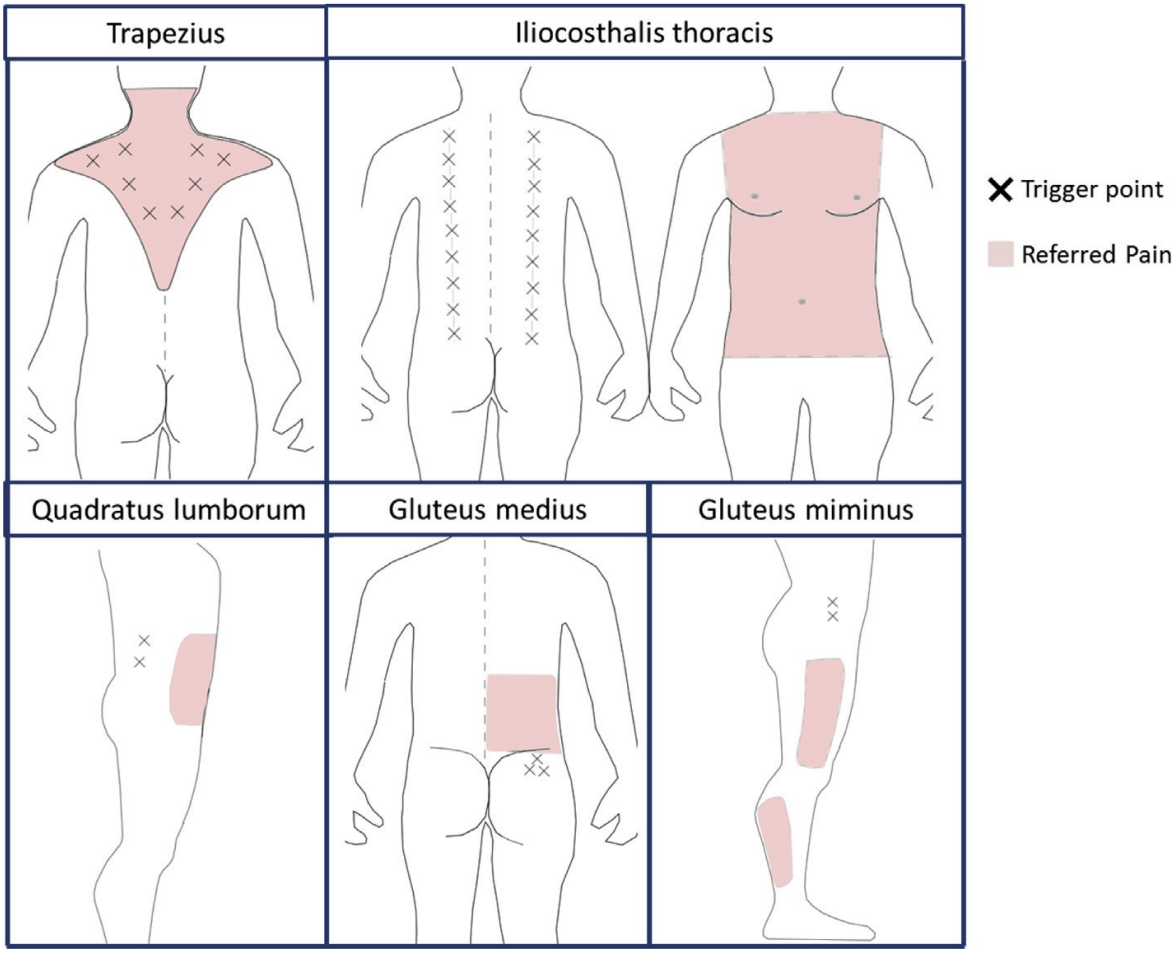

Fig. 1. Muscles frequently affected by myofascial pain syndrome, showing common trigger points and location of referred pain.

Typical features of myofascial pain include a referred pain or pain located distantly from the muscle compromised. This referred pain is specific to each muscle and commonly known as “the muscle signature”. This can mimic other conditions (i.e., pain originating on a quadratus lumborum muscle can resemble appendicitis and other lower abdominal pathologies) (Table 1, Fig. 1). This can result in unnecessary workups

and poor pain control. Another feature of myofascial pain is the presence of a trigger point, a localized, hyperirritable taut band of fibers in the belly of the compromised muscle. When stimulated, the TP reproduces the symptoms including the referred pain.

Although multiple approaches to the management of myofascial pain have been used, trigger point injections (TPIs) are considered more effective and therefore are more commonly used. Conventional medications used in TPIs involve a steroid mixed with a local anesthetic. However, injections of corticosteroid solutions can result in localized skin thinning, muscle atrophy, and even improper hormone regulation. We compared TPIs utilizing normal saline solution versus a conventional active drug mixture on patients presenting with myofascial pain in the emergency department.

	Muscle Location	Referred Pain	Mimicking Pathology
Trapezius	From occiput to thoracic spine and from the clavicle to the scapular spine	Head, neck, shoulder, and mid-back	Meningitis; neck, spine, lung
Iliocostalis thoracis	Axial distribution parallel to thoracic spine; attaches to the lower six ribs	Anterior chest and upper abdomen; correlates with the level of muscle injury	Lung, cardiac, vascular (pneumothorax, coronary artery); upper abdominal visceral (e.g., gall bladder, spleen)
Iliocostalis lumborum	Axial distribution parallel to lumbar spine; from lower six ribs to sacrum and ilium	Lower abdomen and pelvis	visceral, vascular, and gastrointestinal (e.g., diverticulitis, appendicitis)
Quadratus lumborum	Lateral lower back; connects the hip and lower back vertebrae	Lower back, anterior aspect of lower abdomen and pelvis	Lower visceral, gastrointestinal, and pelvic (e.g., appendicitis, ovarian torsion, ectopic pregnancy)
Gluteus medius	Inferior posterior to iliac crest	Lumbar area	Renal and vascular (e.g., pyelonephritis, aortic dissection, urolithiasis)
Gluteus minimus	Between posterolateral iliac spine and femoral head	Buttock, lateral thigh, and posterior leg above ankle	Sciatica
Paraspinal	Adjacent to spine	Posterior thoracic and lumbar area	Vascular, thoracic, and retroperitoneal (e.g., aortic dissection, retroperitoneal)

Tab. 1. Referred pain and mimicking pathology of some muscles affected by MPS.

In our randomized, controlled, blind non-inferiority trial, we enrolled 51 patients with myofascial pain to undergo TPIs with either a conventional mixture (Bupivacaine + Triamcinolone) or 0.9% normal saline. After undergoing TPIs, the patients were assessed using the Numeric Rating Scale of pain (0-10), with 0 being no pain and 10 being the worst imaginable. Additionally, patients were rated on a Likert scale, measuring

satisfaction from 1 (dissatisfied) to 5 (very satisfied). The mean pain scores on initial presentation for patients in the conventional medication and normal saline groups were 8.92 and 8.73, respectively. Pain scores taken immediately following TPIs and then at discharge. For the conventional drug and normal saline groups illustrated a reduction of 5.68 and 5.48 and then 5.96 and 6.17, respectively. While this led us to conclude that TPIs, as a treatment of myofascial pain are effective, it didn't elucidate a notable difference between the two modalities. Subsequent follow-up at two weeks after TPIs demonstrated a mean pain score decrease of 3.09 and 3.05 for the conventional medication and normal saline groups, respectively (Fig. 2). Interestingly, the patient satisfaction was higher on those receiving TPIs with normal saline.

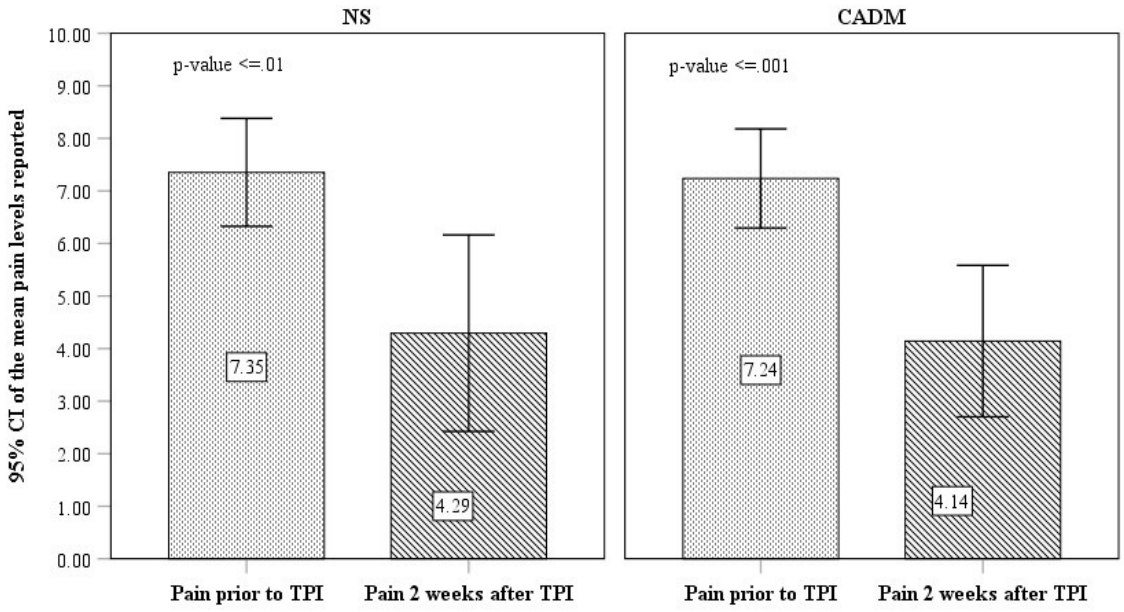

Fig. 2. Pain intensity on a 10-point numerical rating scale prior to TPI and 2 weeks after TPI in two study arms.

Figures show 95% confidence intervals (CI) of the mean pain levels reported in two patient groups: those who received trigger point injection (TPI) with normal saline solution (NS) and those who received TPI with a conventional active drug mixture (CADM). Pain was assessed by patient report on a standardized numerical pain scale. We observed statistically significant differences in pain scores before and 2 weeks after TPI in both study arms ($p \leq 0.01$ and $p \leq 0.001$).

This study concurred with previous studies in demonstrating non-inferiority between normal saline and conventional drug mixtures in the treatment of myofascial pain. The favorable adverse effect profile of normal saline, along with being very cost effective, make it an attractive option for the treatment of myofascial pain syndrome.

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Publication

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