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The Immediate Effects of Matrix Rhythm Therapy on Active Upper Trapezius Trigger Points- A Pilot Study

Marika Mattos*[1], Practitioner, Dr. Meenakshi Pandit[2], Instructor

Correspondence Author: Marika Mattos, Fulcrum Physiotherapy Clinic,1st floor, Shravangad apartment, opp seed Infotech, Prabhat road lane no 14, Dattakrupa Marg, Erandwane, Pune, Maharashtra 411004

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Abstract

Introduction: Myofascial pain is defined as pain which comes from MTrPs in muscle that are considered as hyperirritable spot located within a taut band of skeletal muscle. Matrix Rhythm Therapy (MaRhyThe®) works on normalizing the oscillating frequency of the cells (8-12Hz) and improving supply of oxygenated blood and nutrition through ECM

Objective: 1.To find out the effect of MaRhyThe

Method: Participants were randomly selected based on the inclusion and exclusion criteria they were then treated with matrix rhythm therapy for 20 mins on the active trigger point. Participants were assessed pre and post treatment on the basis of VAS and cervical ROM.

Result**:** Significant improvement was seen in the immediate post VAS and cervical lateral flexion

Keywords: Trigger points, MaRhyThe®, upper trapezius

Introduction

The emotional and tissue stress are generally believed as the negative phenomenon. Due to the presence there can be distinguished the acute and chronic stress[1].Musculoskeletal pain is a major cause of morbidity in today's societies. About one-third of the patients with musculoskeletal pain meet the diagnostic criteria for myofascial pain syndrome[4].It happens that acute stress has the positive effect for mobilization, stimulates the action and allows you to cope with different situations[1]. Myofascial pain syndrome (MPS) is a musculoskeletal disorder that can be acute or chronic. It is precisely defined and its consequences in terms of dysfunction, disability, and financial loss are great[8]. About one-third of the patients with musculoskeletal pain meet the diagnostic criteria for myofascial pain syndrome.[4]There is growing evidence that most of our common aches and pains and many other puzzling physical complaints- are actually caused by 'trigger points' or small contraction knots, in the muscles of the body.[10] Myofascial pain syndrome is defined as pain of muscular origin that originates in a painful site in muscle. This site is characterized by the myofascial trigger points[8]. It is defined by its physical (motor) characteristics and by its sensory features[8].

Types of myofascial trigger points include: Active, associated, attachment, central, key, latent, primary, and satellite. Any myofascial trigger point is to be distinguished from a cutaneous, ligamentous, periosteal, or any other non-muscular trigger point. [11]

Active Myofascial Trigger Point: A myofascial trigger point that causes a clinical pain complaint. It is always tender, prevents full lengthening of the muscle, weakens the muscle, refers a patient-recognized pain on direct compression, mediates a local twitch response of muscle fibers when adequately stimulated, and, when compressed

within the patient's pain tolerance, produces referred motor phenomena and often autonomic phenomena, generally in its pain reference zone, and causes tenderness in the pain reference zone. To be distinguished from a latent myofascial trigger point.[11]

Associated Myofascial Trigger Point: A trigger point in one muscle that occurs concurrently with a trigger point in another muscle. One of these associated trigger points may have induced the other, or both may stem from the same mechanical or neurologic origin. [11]

Attachment Trigger Point: A trigger point at the musculotendinous junction and/or at the osseous attachment of the muscle that identifies the enthesopathy caused by unrelieved tension characteristic of the taut band that is produced by a central trigger point. [11]

Latent Myofascial Trigger Point: A myofascial trigger point that is clinically quiescent with respect to spontaneous pain; it is painful only when palpated. A latent trigger point may have all the other clinical characteristics of an active trigger point and always has a taut band that increases muscle tension and restricts range of motion[11].

Myofascial Pain Syndrome (Myofascial Syndrome): 1.Thesensory, motor, and autonomic symptoms caused by myofascial trigger points. The specific muscle or muscle group that causes the symptoms should be identified.

2. A regional pain syndrome of any soft tissue origin.

3. To avoid confusion, we recommend that when anyone uses the term myofascial pain syndrome, that person should specify which meaning applies— file general or specific definition.

Myofascial Trigger Point (clinical definition of a central trigger point): A hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena[11].

The upper trapezius (UT) muscle was determined to be often affected by MTPs. The common symptoms and pain pattern in participants with MTPs in the UT muscle are taut and painful muscle, tension headache, neck pain, dizziness or vertigo, and limited neck and shoulder range of motion.[4] Trigger points in the trapezius muscle causes pain in the shoulder, occiput, and 5th finger of the upper limb and reduces neck range of motion (ROM).[2]

Each trapezius muscle is flat and triangular, with the base of the triangle situated along the vertebral column (muscle origin) and the apex pointing towards the tip of the shoulder (insertion) [12].

The uppermost part of the trapezius is what gives the back of the neck its shape. The muscle attaches to the base of the skull, the spine, the collar bone, and the shoulder blades. The trapezius supports the weight of the shoulders and must contract strongly to rotate the shoulder blades every time one raises the arm. Another primary function is to hold the shoulder blade solidly in place as a base for the fine operations of the arm and hand.

The upper most part of the trapezius helps support the weight of the head and neck when one bends the head forward or to the side. Faulty posture, such as slumping while seated or habitually carrying the head forward (forward neck posture), places an unnecessary burden on the trapezius muscle, generating trigger points. Shortened pectoral muscles, indicated by a rounded shouldered posture exert a constant pull on the shoulders that the trapezius muscle must constantly counteract.

Another common cause of trapezius trigger points is the emotional tension that keeps the shoulders up (elevated). Any work or physical activity that keeps the shoulders raised puts the muscle at risk of overuse. Trigger points are produced in all parts of the trapezius by a job that requires working with the arms held out in front of the

body for extended periods of time. The constant contraction gives them no chance to rest and recover.

Matrix Rhythm Therapy, is developed by Dr. U G Randoll. According to Dr. U G Randoll's research, the cells in the human body are always oscillating in a frequency ranging between 8-12 Hz provided they are surrounded by healthy extra cellular matrix (ECM). Specially designed and patented resonator of Matrixmobil® produces mechanical- magnetic pulsations. These pulsations gently and harmoniously induces the cells to accept again their own analogue oscillations, resulting in improved supply of oxygenated blood and nutrition through ECM. Elimination of waste products, acids and gases takes place. Improved active cellular transportation results in production of energy in the form of ATP hence healing and regeneration is set in motion.[9]

Specific effects of MaRhyThe ®:

1. Physiological effects: (a) activation of metabolism (b) acceleration of venous and lymphatic flow (c) activation of the immune system (d) normalization of tension in the musculature (e) neuromuscular activation via the reflex arcs (f) targeted relaxation of local muscular spasms (g) targeted removal of muscular remanence.
2. Chemical effects: (a) Acceleration of the thixotropic reaction from gel to fluid. (b) Reduction of viscosity. (c) Regulation of the interstitial pH value. (d) Increase of tissue temperature to normal temperature.

Physical effects: (a) Reduction of tissue fluid absorption. (b) Targeted strengthening of the muscle's own resonance. (c) Triggering the 'direct piezoelectric effect'. (d) Restoration of the colloid osmotic tissue tonus.

Need Of The Study

Very few studies are conducted to find out the effectiveness of MaRhyThe® on musculoskeletal disorders. Results have shown that MaRhyThe ® increases local circulation and reduces edema [5, 17]

Therefore this study intends to explore on the effectiveness of MaRhyThe ® on myofascial trigger points.

Materials and Methodology

Study Design: Experimental pilot study

Study type: Pre- Post

Sampling type: Convenient sampling

Target population: 18-30years

Sample size: 15

Inclusion Criteria

1. Active MTP for at least 2 weeks
2. Neck pain and upper back pain
3. Taut band felt on palpation.

Exclusion criteria

1. CNS deficits
2. Patients with cognitive deficits.
3. Patients with hypermobile joints.
4. Patients with fibromyalgia.
5. Nerve damage
6. Malignant diseases
7. Pregnant women
8. Nerve entrapment
9. Inflammatory musculoskeletal diseases.
10. Recent surgery of the neck and shoulder.

Duration:

1. Duration of treatment: 1day 20 min

Materials required

1. Consent form
2. Inch tape
3. Matrixmobil®
4. Powder

Procedure

The project commenced after the approval from the ethical committee. Subjects were selected from those who complained of upper back pain or neck pain. A written consent was taken from every participant. They were then assessed on the basis of the inclusion and exclusion

criteria. Patients were assessed pretreatment on basis of VAS and cervical lateral flexion and immediately after the treatment were reassessed on the same criteria. Patients were treated with MaRhyThe® for 20 mins on the most painful active trigger point. The patients were in sitting with head down position with a pillow to rest their heads.

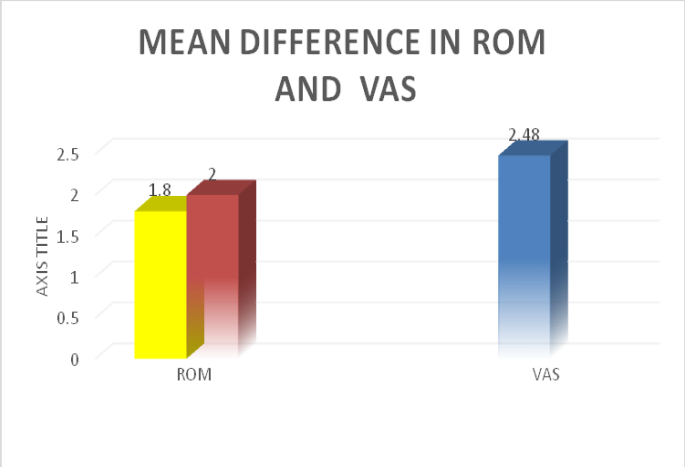
Outcome Measures

1. Cervical lateral flexion Range of motion.
2. Pain on Visual analogue scale (VAS)

Statistical Analysis

The sample size was determined to be 15. Statistical analysis was done by using Paired T- test for calculating the p value. P value was found to be very significant for pain i.e. p=0.000. For cervical lateral flexion ROM on the right side the p value is 0.000 which shows its highly significant and for that on the left side is also highly significant (p=0.000).

Results



The mean difference in ROM is 1.8 and 2 of the right and left side respectively and difference in pre post Pain is 2.48.

Discussion

In a diseased or injured state the muscles have decreased tissue mobility, which leads to increase in contraction of the muscle fibers. This causes a disruption in the oscillating frequency of the cells. The cells in a healthy tissue oscillate with a frequency of 8-12 Hz. In an injured state the cells have less space to oscillate which causes an energy crisis at the cellular level, which means there is less amount of oxygen and nutrients going to the cell. The increase in metabolites causes the pH of the extra cellular matrix to become acidic. Due to the accumulation of metabolite and acidic pH the muscle becomes hard and goes into a state of spasm[19, 20].

In a contracted state acetyl choline is released from the neuromuscular junction, excess of Ach causes disruption of the motor endplate. Hardening of the muscle fibers prevent the sliding mechanism of the sarcomere over each other thus prevents full lengthening of the muscle.

An active myofascial trigger point is a point in the muscle that produces spontaneous pain either if the muscle or joint is moved or at rest. The pain threshold of active myofascial trigger points is very low. Due to capillary compression the muscle goes into an ischemic state, this in turn activates the dorsal horn cells causing pain sensation.

It is important to diagnose the difference between a trigger point and a tender point. Table 1 shows the difference:

The main issue in the MP treatment is to provide pain relief on the trigger points. The major treatment methods are patient training, elimination of trigger factors, medical treatment, superficial & deep heat applications, electrotherapy, stretching and spray technique, acupuncture, local injections, massage and exercise[1]. This study shows how Matrix rhythm therapy as a new intervention works as a treatment modality for myofascial trigger points.

Matrix Rhythm therapy works by delivering rhythmic oscillating frequency of 8-12Hz.The Matrixmobil® produces mechanical- magnetic pulsations. These pulsations gently and harmoniously induces the cells to accept again their own analogue oscillations, i.e. a frequency ranging between 8-12 Hz [17]. This synchronizes with the internal body rhythm thus improving micro circulation and improving oxygen supply to the cells, also

it improves the supply nutrients to the cells by normalizing the pH of the extra cellular matrix making it favorable for the cells to oscillate. This also improves the ATP production in the cell and helps the muscle relax. This relaxed state of the tissue removes the noxious stimuli from the nerve endings causing pain to decrease [17]. Once the trigger point is treated the muscle is relaxed and when stretched, stretches to its maximum limit

Conclusion

This study concludes that Matrix Rhythm Therapy shows significant improvement in pre VAS and cervical ROM and immediate Post VAS and cervical ROM.

Further Scope

1. A larger sample size can be used to get better results.
2. Long term effects of Matrix Rhythm therapy can be checked.

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