

Effects of matrix rhythm therapy in patients with myofascial trigger points

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Abstract

Introduction: Matrix rhythm therapy is a cell biological therapy approach developed at the University of Erlangen, Germany. Low coherent magneto mechanical waves are applied to synchronize the regeneration and function of the cell. The purpose of this clinical trial was to investigate the effects of Matrix rhythm therapy in patients with myofascial trigger points.

Materials and Methods: A sample of 21 patients (17 Women, 4 Men) with upper trapezius myofascial trigger points received 9 sessions of matrix rhythm therapy. Outcome measures were pain and function which were measured by Constant - Murleyscore. Data was collected at baseline and after 9 sessions of treatment intervention.

Results: There was significant difference between the pretest and posttest scores. 20 out of 21 patients had zero pain after 9 sessions of matrix. All the patients showed improvement in function and pain intensity.

Conclusion: The results of this study showed that Matrix rhythm therapy is effective at improving symptoms and deactivating the myofascial trigger points.

Keywords: Matrixrhythm therapy, Myofascial trigger points, Cell biological therapy.

Introduction

A Myofascial trigger point is defined as a hyper irritable and hypersensitive spot in a taut band of skeletal muscle fibers.¹ They are also described as tender nodes of degenerated muscle tissue that can cause local and radiating pain.² In addition to sensory symptoms like pain, trigger points can cause motor and autonomic symptoms.^{1,2} Trigger points can occur in ligaments, tendons, joint capsule, skin, and periosteum other than muscle.^{1,2}

Myofascial trigger points are categorized into active and latent. Active trigger points are spontaneously painful and symptomatic, while the latent trigger points are painful when compressed but otherwise asymptomatic.^{1,2} An active trigger point can prevent full lengthening of the muscle, weakens the muscle and mediates a local twitch response of muscle fibers when stimulated.^{1,2}

A latent trigger point which is painful only when compressed may also have all the other clinical characteristics of an active trigger point like preventing full lengthening, weakening the muscle, autonomic dysfunction and local twitch response.^{1,2}

Trigger points are developed after muscle over use such as repetitive or sustained low-level muscle contractions, maximal or submaximal concentric contractions and eccentric muscle contractions.¹⁻⁵ Energy crisis (ATP) in the muscles causes the formation of trigger point. ATP is required for the contraction as well as relaxation of the muscle. During relaxation phase without ATP, the cross bridge formed between actin and myosin cannot be detached, so the sarcomere is in contracted stage. The whole process leads to the formation of taught band and trigger point.¹⁻⁵ Other causes of trigger point formation were direct trauma, joint dysfunction, after surgery, neurological influences and poor body mechanics.¹⁻⁵ There are many non-invasive methods like stretching, laser therapy, ultrasound and invasive methods like dry needling, trigger

point injection, acupuncture to manage myofascial trigger points.

A new therapeutic and clinical modality matrix rhythm therapy was developed by Dr. Ulrich Georg Randoll is based on research carried out in 1989-1997 at the department of oral and maxillofacial surgery and trauma surgery of Erlangen University. Matrix is a cell biological therapy which activates and rebalances specific physiological vibrations of skeletal muscle and nervous system.⁶ Matrix reactivates the cell metabolism and normalizes the physiological process by depth-effective rhythmical phase synchronous magneto mechanical oscillations.⁶ The frequency of matrix is modulated between 8 and 12 Hz. In this process the cells are stimulated and the entire tissue is rhythmically resynchronized.⁶ Matrix basically works and improves the tissue extensibility, and also the circulation. The contracted areas of the musculature will be inductively relaxed by increased circulation which increases oxygenated blood followed by ATP synthesis and dissolution of the tension.⁶ Matrix Rhythm Therapy was extensively used in Orthopaedic, Neurological and vascular conditions.

We found no previous study on the effects of matrix rhythm therapy in patients with myofascial trigger points. The aim of the study was to find the effects of matrix rhythm therapy on pain and functional components of trigger points in upper trapezius muscle.

Materials and Methods

Twenty one participants were selected who had pain and active trigger points for the past six months. Patients with pain less than six months and other clinical conditions were excluded. Patients with the following conditions were also not included in the study. Thoracic outlet syndrome, rheumatological disorders, neurological disorders which could result in muscle weakness in the shoulder, rotator cuff

tears. Evaluation of trigger point was by palpating a hypersensitive nodule in the upper trapezius muscle which elicited pain.

Outcome measures were pain and function. Both were measured using Constant – Murley shoulder outcome score. The Constant-Murley scale is a 100 point scale where higher scores indicate better function. It is composed of four parameters. They are pain (15 points), ADL (20), ROM without pain (40) and strength (25). All the parameters were measured in a standardized way.⁷ Every patient received treatment at the clinic, three times a week for three consecutive weeks totaling 9 sessions. Assessments were performed at baseline and three weeks after the treatment by the same physiotherapist.

Intervention

Matrix rhythm therapy was applied by a physiotherapist who is trained and certified in the matrix rhythm therapy programme. Matrix was applied for sixty minutes along the course of the muscle fibers of upper trapezius from proximal to distal and distal to proximal with patient sitting in relaxed position.

Results

Twenty one patients (17 women, 4 men) with mean age of 32.3 years were included in the study. We used graph pad instant V3.0 for data analysis. Kolmogorov – smirnov test was used to assess the distribution of data and our data were found to be normally distributed. Paired t test was used to assess the results. Pretest and post test scores of the Constant-Murley scale were assessed and the two tailed p value < 0.0001 were considered significant.

Discussion and Conclusion

This study evaluated the effectiveness of matrix rhythm therapy in patients with trigger points. Our findings indicated a significant improvement in pain intensity and function. After 9 sessions of matrix rhythm therapy all patients showed clinical and statistical improvements. 20 out of 21 patients had zero pain after 9 sessions of matrix. According to Dr. Randall, Matrix reactivates the cell metabolism and the physiological process is normalized by phase synchronous magneto mechanical oscillations. Based on the principle of resonance, matrix oscillates the cells between 8-12 Hz. The deactivation of trigger points may be attributed to biochemical and metabolic changes after applying matrix around the trigger point.

Previous studies found that there was a significant difference in the levels of biochemicals like Bradykinins (BK), Prostaglandins (PG), Calcitonin gene-related peptide (CGRP), and Substance P (SP) between myofascial trigger points and healthy muscle tissue.⁸ These substances increase local blood flow and pressure, which activates the mechanoreceptors and nociceptors leading to increased local tenderness and pain. pH levels were also less in the myofascial trigger points than healthy muscle tissue.⁸ Acidic pH levels in the muscle tissue have been associated with pain and lowered nociceptor threshold sensitivity.^{9,10}

An earlier study found that matrix increases the blood circulation by 35%.¹¹ After the application of matrix as the blood circulation increases, the metabolic by products and other biochemicals are disposed, thus, the pH gets normalized and the metabolism of the cells are restored. As a result, ATP is produced which is required for the actin myosin detachment during the relaxation phase of the muscle. Thus the trigger point gets deactivated and normal function of the muscle is restored.

Biological scaffold materials derived from extracellular matrix from living tissues was successfully used in tissue regenerative medicine applications.¹² Matrix rhythm therapy generates asymmetrical pressure distribution and sets the extra cellular matrix into motion, thus, the exchange of metabolites and nutrients is strengthened at the cellular level.

Matrix can be suggested as an alternative method for treating trigger points. There are limited numbers of studies with low level of evidence about the effects of matrix rhythmous therapy. Randall and Hennig applied MRT in 65 patients with low back pain over six sessions within a week, and they reported a significant improvement in pain.¹³ Jager et al. have assessed the effect of matrix on pain, sleep and ROM of the spine in patients with low back pain. They compared matrix with other conservative therapies like electrotherapy and exercise. Results of their study, involving 80 patients, indicate that matrix is more effective in reducing pain and increasing flexibility.¹⁴ In our study matrix application decreased pain and restored normal muscle function. Further studies are necessary to find the biochemical changes in the muscle before and after application of matrix rhythm therapy. We also recommend comparing matrix with other treatment modalities.

Study Limitations

The study population and the absence of control group is the main limitation of the study to assess the placebo effects. The strength component of the scale was not measured using a dynamometer. There was no follow up to find the long-term effects of matrix.

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Conflict of Interest: Nil.

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