Review Article

Matrix Rhythm Therapy – A Novel Treatment

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Abstract

Matrix rhythm therapy (MRT) is an advanced electrotherapeutic modality, which works on mechanical and magnetic vibrations and delivers physiological rhythmical oscillations, whose frequency changes according to the individuals' tissue requirement that synchronizes with internal body rhythm. The aim of the study is to find in which conditions MRT can be effective with or without conventional physiotherapy. Databases used were Google scholar, PubMed, with keywords MRT advance physiotherapy. Studies published in English, original articles from 2018 to 2023 were included. All types of studies were included: systemic reviews, reviews, randomized controlled trials (RCTs), case series, and case report. Duplicate and irrelevant articles were excluded. Fifteen articles were found of which 9 studies were included. In this study, 1 systemic review, 1 review, 3 RCT, 1 case series, and 3 case reports were there. However, MRT with conventional physiotherapy was found to be superior in reducing pain and improving range of motion, strength, balance, gait parameters, muscle tone, strength, and quality of life. MRT may show great effects in decreasing spasticity when used with other conventional physical therapy. This brief study found that the MRT is effective, which exists as new development in the stream of physiotherapy. MRT is a recent tool in rehabilitation that is being used in conditions such as chronic back and neck pain, frozen shoulder, stroke, plantar fasciitis, decubitus ulcer, trigeminal neuralgia, oral submucous fibrosis, burns, and lymphedema.

Keywords: Matrix rhythm therapy, physiotherapy, recent advance

Introduction

The origin of matrix rhythm therapy (MRT) was in Germany by Dr. Ulrich Randoll at University of Erlangen, Munich, Germany, which include the concept of vibromassage. This therapeutic modality is a new invention of the 21st century for the management of pain and restricted mobility. Between the periods of 1989 and 1997, researcher discovered that cells of warm blooded animals oscillate rhythmically between the frequencies of 8 and 12 Hz. He also state that muscles also shiver between 8 and 12 Hz, which is a physiological frequency. MRT works on dynamic biological frequency which was required for healing dynamic biological body.[1]

It was proved to be effective in conditions related to disturbance in microcirculation. It is used for various conditions such as perioperative domains, trauma surgery, for rehabilitation. This modality also works for pain management as well as the treatment of chronic diseases of the nervous system, skeletal, and locomotor system. The main aim of MRT is to convert pathology into physiology which is required for the healing of tissues.[1]

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This modality works on the principle that all tissues in the body vibrate/oscillate with a frequency of 8–12 Hz. The application of MRT is based on longitudinal stroking by pushing the probe of device into the soft tissues.[2] The compression effect created by MRT causes the release of more efferent stimuli and soft-tissue mobilization. Callaghan suggested that the major effect of mechanical vibration massage is increase in the blood circulation leading to tonic vibration reflex causing active contraction of muscles. This muscle contraction causes an increased blood supply [Figure 1]. A study conducted by Taspinar *et al*. concluded that MRT improved the blood circulation by 35% compared to conventional massage in young females.[3] MRT restores good tissue resonance and the vibrations produced by the instrument clear the extracellular matrix and improve the venous and the lymphatic circulation. The

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device produces the oscillations of the frequency that is like the cellular oscillations and can be utilized for therapeutic purposes in various musculoskeletal conditions.[4]

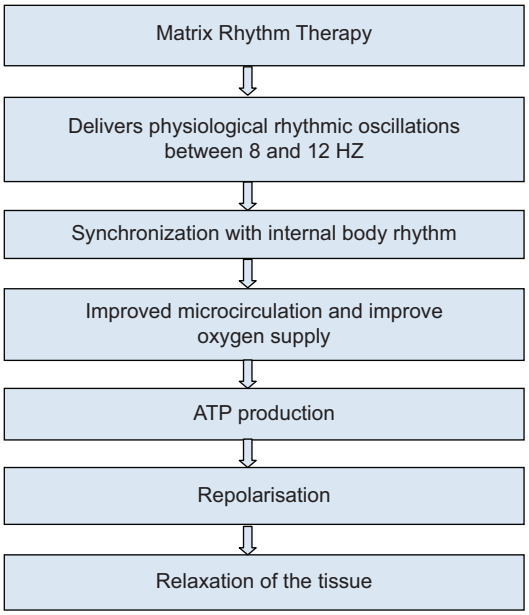

Figure 1: Mechanism of action of matrix rhythm therapy

MRT is a basic kind of therapy method to maintain the body's good health (prevention) and support the healing of muscular skeletal problems, postoperatively as well as rehabilitative. The deficient energy metabolism at the cellular level during disease must be normalized before any adequate therapies. In the MRT, the cellular metabolism can be rehabilitated before subsequent macroscopic exercises which will move and train the muscles. It also helps in healing pain and re-adaptation of shifted dynamic equilibrium on a cell biological level and this healing must be activated at the cellular level.[5]

Methods

In this review databases used were Google scholar, PubMed, with keywords MRT, and advance physiotherapy. Inclusion criteria for the studies were published in English, Original articles from 2018 to 2023, Systemic reviews, reviews, randomized controlled trials (RCTs), case series, and case report. Duplicate and irrelevant articles were excluded.

Results

Fifteen articles were found of which 9 studies were included. In this study, 1 systemic review, 1 review, 3 RCT, 1 case series, and 3 case reports were included as mentioned in Table 1 and

Table 1: Description of reviewed articles

Author/title	Intervention	Outcome measure	Conclusion
Jassal, *et al*. Matrix rhythm therapy as a part of early intervention in burn patients to improve their quality of life: A systematic narrative review. 2019[1]	Stretching exercises combined with MRT implemented on affected joints to improve the ROM	QOL	The studies performed on MRT provide significant evidence on efficacy of MRT in postburn injuries as an early intervention for treatment of burn patients. Physiotherapists can use MRT to rehabilitate them as early as possible to improve their QOL
Huddar V and Pattanshetty R. Application of matrix rhythm therapy (MaRhyThe©) for the treatment of decubitus ulcer in cancer. 2021[6]	Patient was given MRT for decubitus ulcer on alternate Days and exercises that included general mobility exercises, strength training for lower limbs, balance training, and hourly positional change on a regular basis. A total of 12 MRT sessions were given lasting for 60 min–75 min	VAS for pain, FIM Scale (FIMS) for functional assessment, and QOL by FACTG	The present case suggests as an important physical therapy option in the treatment of decubitus ulcer in cancer patients, highlighting the reduction in ulcer size and decreasing pain, thereby improving QOL and functional independence
Naik V. Effect of matrix rhythm therapy (MaRhyThe©) in trismus: A case series. 2020[4]	The application of MRT was by pushing the probe of the device into the muscles of anterior and posterior neck, and entire face. The duration of every session was 60 min for every subject	VAS, mouth opening (in mm)	MaRhythe© is a recent tool in rehabilitation that is effective in managing Trismus by reducing pain and improving joint mobility
Bhatikar K. Effect of matrix rhythm therapy in B/L adductor muscle tightness in pediatric cerebral palsy: A case report. 2018[8]	In the study MRT was applied for 45 min for the hip region and both the adductor muscles. MRT was given for the alternate sessions. The patient was then given active assessed stretching and other conventional exercises of the therapy session	Modified Ashworth Scale	We can conclude that the MRT may increase the extensibility of a spastic muscle that can be further managed by the actively assisted stretching and other conventional therapies
Naik VC, *et al*. Efficiency of matrix rhythm therapy on pain, strength, and quality of life in forward neck posture: A randomized controlled trial. 2022[7]	The session was delivered for 60 min. The treatment was concentrated more on tender points to release the tightness and reduce pain. Only one session of 45–60 min was given per subject	Craniocervical flexion endurance test for strength, a pain Algometer for pain pressure threshold, and SF 36 for QOL	It was determined that both deep exercise programs and MaRhyThe© when combined with conventional physiotherapy are effective in treating FHP. However, MaRhyThe© with conventional physiotherapy was found to be superior in reducing pain and improving ROM, strength, and QOL

MRT: Matrix rhythm therapy, ROM: Range of motion, VAS: Visual Analog Scale, FIM: Functional Independence Measure, FIMS: FIM Scale, QOL: Quality of life, FACT G: Functional assessment of cancer therapy – general, SF 36: Short form 36 health survey questionnaire, FHP: Forward head posture

discussion. The effect of MRT was encouraging on trigeminal neuralgia and also effective in trismus and deactivating the myofascial trigger points. However, MRT with conventional physiotherapy was found to be superior in reducing pain and improving range of motion (ROM), strength, balance, gait parameters, muscle tone, strength, and quality of life.

Discussion

MRT is a newer tool in the field of rehabilitation that has shown to be effective in treating pain and restricted mobility of the musculoskeletal system. The findings from this review describe the effects of MRT in different conditions.

MRT may have a greater influence in normalizing the tissue function that may aid the injured tissues to regain the normal functioning. In the case report of subacute Bell's palsy treated with combination of MRT and conventional physiotherapy showed an adequate improvement in functions of facial muscles. The MRT can be considered as effective therapeutic intervention in case of subacute Bell's palsy for faster recovery.[8]

An earlier study found that MRT increases the blood circulation by 35%. After the application of matrix as the blood circulation increases, the metabolic products and other biochemicals are disposed, the PH gets normalized and the metabolism of the cells is restored. As a result, adenosine triphosphate is produced which is needed 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.[9]

A prospective longitudinal analytic study conducted by Sandeep Bhagwat saw the role of MRT in the management of nontraumatic limited shoulder motions. A prospective longitudinal analytic study was carried out. The very first forty individuals reported to Niramay Rehab with limited and stressful arm motions and no evidence of injury or disease were included in the study. All patients got an hour of Matrix-Rhythm Therapy once a week for 3 weeks, followed by daily shoulder mobility exercises. The discomfort was measured using the Visual Analog Scale on the first, eighth, and 15th days of treatment, and the ROM was measured using an instrument. The MRT exhibits a better and quick effect in increasing the affected ROM and, as a result, which is not witnessed in other conventional modalities with just one treatment setup in various pathological conditions and in various chronic diseases.[10] Naik *et al*. conducted research in order to determine the effectiveness of MRT on the frozen shoulder in terms of stress and physical function, 10 volunteers between the 40 and 60 years of age were tested and treated. Distress was measured using the Visual Analog Scale (VAS), and joint ROM was measured using a universal goniometer. Before and after the first session, the VAS and joint ROM were measured. When MRT was used to heal a frozen shoulder, the findings showed a VAS and joint ROM both improved considerably statistically. It showed encouraging results in lowering pain by 30% and enhancing shoulder ROM after just one therapy session.[10]

Very few studies have focused on the effect of MRT on wound/ulcer. The study done by Bhatikar evaluated the effect of MRT along with the contemporary physiotherapy treatment (LASER + PEMF + Exercise) on the chronic vein dysfunction deep foot ulcer. They found positive results in treating the deep-vein ulcers. The study concludes that MRT along with the pulsed electromagnetic field therapy and LASER therapy is beneficial in the healing of a long-standing nonhealing deep-vein ulcer.[11] Future studies can be done to compare the long-term outcomes of these treatment.

Conclusion

This brief study found the MRT is effective, which exists as new development in the stream of physiotherapy. MRT is a recent tool in rehabilitation that is being used in conditions such as chronic back and neck pain, frozen shoulder, stroke, plantar fasciitis, decubitus ulcer, Bell's palsy, trigeminal neuralgia, deep foot ulcer, oral submucous fibrosis, Burns, and lymphedema. Adapting to the recent advancement in technological trends in the field of rehabilitation is the need of the hour.

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Conflicts of interest

There are no conflicts of interest.

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