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Effectiveness of matrix rhythm therapy in frozen shoulder with respect to ROM and pain- An experimental study

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Abstract
Background: Frozen shoulder also formerly termed as adhesive capsulitis that causes tissue degeneration, joint capsule thickening and diminished glenoid cavity with joint restriction and pain. It is one of the most frequently observed shoulder disease in clinical setting.
Patients and Methods: 10 participants were assessed and treated between the age group of 40-60 years at Niramay Physiotherapy Centre, Belagavi, Karnataka, India.
Methods: The subjects were included in the study on the basis of convenience sampling. Outcome measures used were the Visual Analog Scale (VAS) for pain and joint Range of Motion (ROM) was assessed using a universal goniometer. VAS and Joint ROM were assessed pre-treatment and immediately after the first session.
Results: The results showed that there was significant statistical improvement in VAS and joint ROM of the frozen shoulder when treated with Matrix Rhythm Therapy. It showed positive results in reducing 30% of pain and increased shoulder ROM with just one session of treatment setting.

Keywords: Matrix rhythm therapy, frozen shoulder, Visual Analog scale, range of motion, shoulder Joint

Introduction
Codman (1934) first used the term frozen shoulder to describe the common features of slow onset, pain near the insertion site of the deltoid, inability or difficulty in sleeping on the affected side, painful and restricted elevation and external rotation of the shoulder and a normal radiological appearance. The frozen shoulder syndrome was subdivided into primary or idiopathic cases by Lundberg (1969) and those in which the condition was secondary to soft-tissue injury, arthritis, fracture, hemiplegia or any other known cause [1].
The commonest cause of shoulder pain which is estimated to affect 2-5% of the general population is the adhesive capsulitis which is also termed as frozen shoulder, stiff painful shoulder, or periarthritis [2].
It is a disease that causes tissue degeneration, joint capsule thickening, and diminished glenoid cavity volume. One of the most frequently observed shoulder diseases in clinical settings has various aetiologies such as periarticular tissue degenerative changes, synovial joint thickening and articular surface adhesion. It is divided into three stages: (1) severe pain, (2) gradual restrictions in ROM accompanied by pain, and (3) pain resolution and ROM recovery [3].
The pathophysiology of frozen shoulder involves a diffuse inflammatory synovitis with subsequent adherence of the capsule and a loss of normal axillary pouch and joint volume, which in turn leads to a noteworthy loss of motion of the shoulder joint. The contracture of the capsule is thought to result from the adhesion of the capsular surfaces or fibroblastic proliferation in response to cytokine production. The capsule of the shoulder is thickened in adhesive capsulitis and a mild chronic inflammatory infiltrate and fibrosis maybe present. The adhesive capsulitis is primarily a fibrosing condition affecting the capsule (fibrous bag around a joint) of the shoulder joint has been stated in many of the modern work, such as that of Bunker. This causes tightness of the coracohumeral ligament (one the ligaments attaching the shoulder to the humerus) which in turn leads to restriction of passive movement of the shoulder especially the external rotation [4].

Matrix Rhythm Therapy (MRT) is a new encroachment which uses the concept of vibromassage in special education and rehabilitation centres; sports clubs; and neurologic, orthopaedic, physical therapy and rehabilitation centres [5].

Matrix Rhythm Therapy was postulated by Dr. Ulrich G. Randoll which works on the principle of that all tissues in the body vibrate/oscillate with a frequency of 8 to 12 Hz (on the same frequency range as the alpha rhythm of the brain) which maintains the normal physiologic function of the body and any disturbance such as injury, inflammation, trauma interrupts the rhythm which causes further loss of function and pain in the body [6, 7].

Matrix Rhythm Therapy restores the good tissue resonance. The lifting action produced by the oscillator as a horizontal micro extension movement is transferred to the inner organs, tissues and bones. There is clearance of the extra cellular matrix (entrainment) as the neural α-γ is normalized and the venous and lymphatic flow of the entire area of improved micro circulation is accelerated [8].

The primary objective of this study is to assess the effectiveness of matrix rhythm therapy on frozen shoulder with respect to pain and ROM.

Materials and Methods

This study was a pre post experimental trial. A total number of participants participated in this study was 10 (n=10). The purpose of the study was explained to the participants in their vernacular language and a written informed consent was obtained from all the subjects. Subjects were included in the study if they met the following inclusion criteria: 1) Male participants clinically diagnosed with Frozen Shoulder. 2) Symptoms related to frozen shoulder > 3 months. 3) Age group between 40 – 60 years, and participants willing to participate in the study. Exclusion criteria were 1) Diabetes Mellitus 2) Post operated cases at shoulder. 3) Allergic skin conditions. Subjects belonged to Niramay Physiotherapy centre, Karnataka.

Outcome Measures

Pain Intensity was measured by Visual Analog Scale (VAS). A scale of 10 cm to evaluate intensity of pain where 0 represents no pain and 10 represent unbearable pain. Universal goniometer was used to measure shoulder joint ROM. Outcome measures was assessed Pre - Post immediately after the first treatment session.

Fig 1: Matrix Rhythm Therapy

Intervention

Subject was lying down on the couch comfortably as instructed by the therapist. The area to be treated (around the deltoid, pectorals, trapezius, scapula pectorals and axilla) was exposed and powder was applied over it in order to avoid the friction caused by the MaRhyThe probe. The application of MaRhyThe was longitudinal stroking by pushing the probe of the device into the soft tissues. The application was over entire muscle length including shoulder joint line, axilla and scapula each Session lasted for 60 to 75 min.

Results

Table 1: Age distribution and Anthropometric Variables.

Variables	Min	Max	Range	Mean	SD	SE
Age (yr's)	42.00	68.00	26.00	52.90	7.78	2.46
Height	158.00	182.00	24.00	170.30	7.75	2.45
Weight (kg)	55.00	65.00	10.00	59.90	2.81	0.89
BMI	18.30	23.20	4.90	20.72	1.56	0.49

Table 2: Normality of all values.

Variables	Z-value	p-value
V.A.S.	0.6340	0.8170
Flexion	0.5790	0.8900
Abduction	0.6240	0.8310
Internal rotation	0.3900	0.9980
External rotation	0.7480	0.6310

Table 3: Comparison of Pre and Post VAS Scores by Wilcoxon Matched Pairs Test

Time	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of change	Z-value	p-value
Pretest	6.04	0.85	1.86	1.02	30.79	2.8031	0.0051*
Posttest	4.18	0.95					

Table 4: Comparison of Pre and Post Flexion, Abduction, Internal Rotation and External Rotation Scores by Wilcoxon Matched Pairs Test

Variables	Time	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of change	Z-value	p-value
Flexion	Pretest	119.60	14.20	-30.30	11.62	-25.33	2.8032	0.0051*
	Posttest	149.90	8.36					
Abduction	Pretest	87.60	12.32	-16.70	6.20	-19.06	2.8031	0.0051*
	Posttest	104.30	7.36					
Internal rotation	Pretest	18.30	7.53	-4.70	2.83	-25.68	2.6656	0.0077*
	Posttest	23.00	8.54					
External rotation	Pretest	15.30	8.03	-4.60	2.50	-30.07	2.8033	0.0051*
	Posttest	19.90	8.96					

Discussion

The results of this study indicate that matrix rhythm therapy performed into joint resistance, when compared with a conventional treatment, is effective in increasing the range of shoulder movement. (Tables 1-4)

A study conducted to compare the effects of massage and matrix rhythm therapy on the peripheral blood circulation on the hamstring and triceps surae muscle of left lower extremity in young females and the result concluded that Matrix rhythm therapy had significant increased peripheral blood flow [5].

Matrix Rhythm Therapy allows the cell metabolism of the tissue to be reactivated with depth-effective rhythmical micro-extensions and the contracted areas of the musculature will be inductively relaxed (circulation > oxygen > ATP > dissolution of the tension) [7].

Matrix Rhythm Therapy helps in releasing the blocked neuromuscular processes and restores the sympathovagal balance, so that – in the language of Vedas – the embodied spirit is made to become one again with the Universal spirit [9].

A study was conducted comparing three different physiotherapy modalities like ultrasound, laser therapy and matrix rhythm therapy used in treatment of burns. Active and passive ROM was significantly improved in the ultrasound and matrix rhythm therapy than the laser therapy. In the matrix rhythm therapy group there was an increase in the passive ROM which could be a result of micro-stretching characteristic of the treatment on the scar tissue. The pressure sense was measured pre and post treatment and optimistic results were found in the MRT group than in the laser therapy group. The study showed that MRT had positive effect on sensory function. It could be due to rebalances the cellular micro-processes upon which cell regeneration and cellular healing depend. The result in the current study showed significant increase in the muscle force only in the MRT group which suggests that MRT is more effective in restoring muscular strength when compared to other treatment modalities [10].

MaRhyThe is known to promote the normal Physiologic logistics at the inter and extracellular level by maintaining the normal pH of the tissues by micro mobilization using the applicator.

There are proven evidences that promote improved micro circulation within the tissues which gives the basis of enhanced removal of metabolic waste products, reduction in oedema and improving extensibility of soft tissues.

MaRhyThe has showed positive results in term of muscle relaxation and lightness in the treated part.

Limitations

Muscle soreness was one of the limitations which can be seen post MaRhyThe session as the session duration is 60 to 75 min.

Female subjects are not included in the present study.

Conclusion

The MaRhyThe shows greater and faster result in gaining affected ROM of shoulder joint and subsequently reducing pain in frozen shoulder patients which is not seen in other conventional modalities.

The study concluded that MaRhyThe is effective in treating Frozen shoulder in terms of pain and ROM.

MaRhyThe showed positive results in reducing 30% of pain and increased Shoulder ROM with just one setting of treatment setting.

Scope of the Study

The scope of present study is to compare the effectiveness of MaRhyThe with other conventional physiotherapeutic modalities.

The study also promotes further researches with respect to Randomized Controlled Trails and Randomized Clinical Trial.

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