



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2023; 9(8): 33-36
www.allresearchjournal.com
Received: 20-06-2023
Accepted: 28-07-2023

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Efficacy of matrix rhythm therapy on pain and disability among patients with adhesive capsulitis of shoulder

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DOI: <https://doi.org/10.22271/allresearch.2023.v9.i8a.11157>

Abstract

Background: Adhesive capsulitis, also known as frozen shoulder, is characterized by joint limitation, discomfort, and tissue degeneration due to thickening of the joint capsule and reduction of the glenoid cavity. Matrix Rhythm therapy (MRT), as vibratory massage, is recent advancement in physiotherapy, used to decrease the pain, improve functional status and quality of life in individuals with frozen shoulder.

Aim: Effects of matrix rhythm treatment on the pain and disability in patients with frozen shoulder.

Material and Methods: 36 participants of age group between 40-60 years old were assessed and treated at Orthostar Hospital, Khanpur, New Delhi. Two groups formed based on intervention, Group A received Conventional therapy and Group B received Conventional therapy along with Matrix Rhythm therapy. Outcome measures taken were Numeric Pain Rating Scale (NPRS) and Shoulder Pain and Disability Index (SPADI).

Results: The results showed significant statistical improvement in pain and disability reduction among subjects in group B.

Conclusion: The MRT exhibits greater and quicker results than other conventional therapies and modalities in restoring impacted shoulder joint in terms of pain and disability reduction in frozen shoulder patients.

Keywords: Adhesive capsulitis, numeric pain rating scale (NPRS), SPADI, shoulder Joint

Introduction

Frozen shoulders are characterized by shoulder joint pain, reduced range of motion, and stiffness. This condition most commonly affects individuals over the age of 40 years [1]. Matrix Rhythm Therapy (MRT) is an innovative form of physiotherapy, utilizing vibration and massage principles, and was developed by Dr. Ulrich G. Randall. MRT aims to activate and harmonize the natural physiological vibrations of skeletal muscles and the nervous system [2]. Frozen shoulder is also characterized by discomfort and affect quality of life by impacting the activities of daily living that includes a variety of self-care activities including eating, brushing one's hair, or grooming [3]. Exercise is more efficient and bearable after a brief period of superficial heating in a warm tub or shower. Simple pendulum movements can effectively stretch the shoulder joint [4].

Matrix Rhythm Therapy is particularly effective in treating frozen shoulder as it can relax muscles in specific areas through rhythmic micro-extensions. Due to its oscillating qualities and proven effectiveness, an increasing number of individuals are turning to MRT for relief [5]. Also known as vibratory massage, Matrix Rhythm Therapy helps alleviate joint stiffness and pain, offering a cell biological therapy approach. By not only providing relief from shoulder discomfort but also promoting balanced physiological vibrations in the arm's range of motion, MRT proves to be a valuable treatment option [6]. All human tissues vibrate between 8 and 12 Hz, the same frequency as the brain's alpha rhythm and the speed at which the body maintains homeostasis. Any external damage or trauma might disrupt this frequency, causing pain and limiting function. According to the theory underlying Matrix Rhythm Therapy (MRT), a vibromassage therapy, Matrix Rhythm Therapy is shown to restore the good tissue resonance with the extracellular matrix serves as a cell's habitat [7]. MRT is based on the premise that all biological components vibrate or oscillate between 8

and 12 Hz. frequency, allowing the body to continue carrying out its physiological tasks as usual. The lifting action produced by the oscillator as a horizontal micro extension movement is transferred to the inner organs, tissues and bones [8] This study focused on evaluating the effect of Matrix rhythm therapy along with conventional therapy and only conventional therapy on pain and disability in patients with frozen shoulder.

Materials and Methods: A pre-post experimental trial was conducted on 36 patients and signed informed consent was obtained from each subject. Both male and female between 40 and 50 years, officially diagnosed with frozen shoulder and symptoms lasting longer than three months were included. Patients were excluded with any history of diabetes mellitus, shoulder problem following surgery and any dermatological allergies.

Pre measurement of outcome measures taken before therapy and post measurements taken 2 weeks later after providing therapy. Outcome Measures taken were The Numeric Pain Rating Scale (NPRS) used to assess pain intensity. The level of pain is measured on a scale of 0 to 10, with 0 denoting no pain and 10 denoting intolerable pain. The Shoulder Pain and Disability Index (SPADI) was utilized to assess present shoulder pain and disability. It comprises 13 items that evaluate two primary aspects: a 5-item subscale for gauging pain and an 8-item subscale for measuring disability. There are two versions of SPADI: the original version, in which each item is rated on a visual analogue scale (VAS), and a second version, where items are assessed on a numerical rating scale (NRS). In the NRS, the VAS is replaced by a 0-10 scale, and patients indicate the number that best represents their level of pain or disability. The scores for

each subscale are summed and converted to a scale out of 100. By calculating the mean of the two subscale scores, a total score out of 100 is obtained, with a higher score indicating more pronounced impairment or disability. The calculated total score of SPADI is given in terms of percentage [9].

Group A- Conventional Therapy) - Conventional therapy was given for three times a week for 2 weeks with session of hot water fermentation for 10 minutes followed by exercises with 10 repetitions in one set given. Exercise include a stick include flexing, extending, rotating internally, rotating externally, abducting, and adducting in supine lying position. In addition, pendulum drill, strengthening workout given which includes - Retraction of the scapula, stretch in the posterior capsule and isometric shoulder external rotation.

Group B (Conventional therapy along with Matrix rhythm therapy)- Same conventional therapy with same dosage as in group A. In addition, MRT was given with subjects in lying position around the deltoid, pectorals, trapezius, scapular and axilla regions which was uncovered and talcum powder was used to reduce friction from the MRT probe. Using MRT, longitudinal stroking was done by putting the probe into the soft tissues. The whole muscle length, including the shoulder joint line, was covered by the application. Three times a week, for 60 to 75 minutes total with 8 to 12 Hz Frequency given after the conventional therapy.

Results

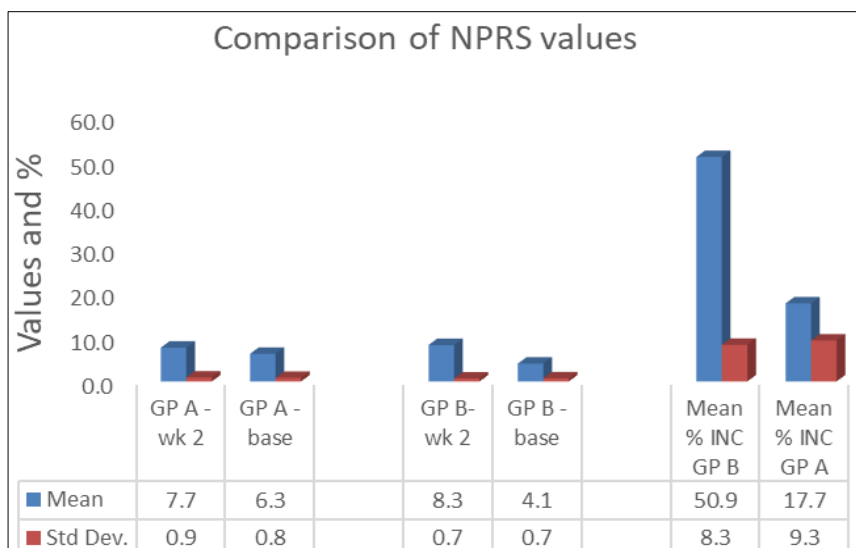


Fig 1: Comparing the NPRS scores between the Base and Week 2 groups in Group A and B

The study yielded a significant 't' value of 6.93 at p= 0.01. This demonstrates the considerable difference between the Base and Week 2 Mean NPRS values. The Mean NPRS Base value [7.7] is much less than the Mean NPRS Value in the Second Week [6.3] as depicted in figure 1. As a result, the Group A intervention was successful in lowering the NPRS levels.

The study showed a significant 't' value of 22.15 at p=0.01. Compared to the Mean NPRS Base values [8.3], the Mean NPRS values in week 2 [4.1] as shown in figure 1 are

considerably lesser. This demonstrates the considerable difference between the Base and Week 2 Mean NPRS values. As a result, the NPRS levels were successfully decreased by the intervention applied in Group B.

NPRS readings fell below their baseline values in week two between groups A and B. This demonstrates the considerable difference between the Mean NPRS percent decrease values in groups A and B. The mean NPRS percent decrease in Group B (50.9%) is substantially HIGHER than the mean NPRS percent decrease in Group A (17.7%) as

depicted in figure 1. As a result, compared to Group A, the intervention implemented in Group B has had the greatest

effectiveness in lowering NPRS levels.

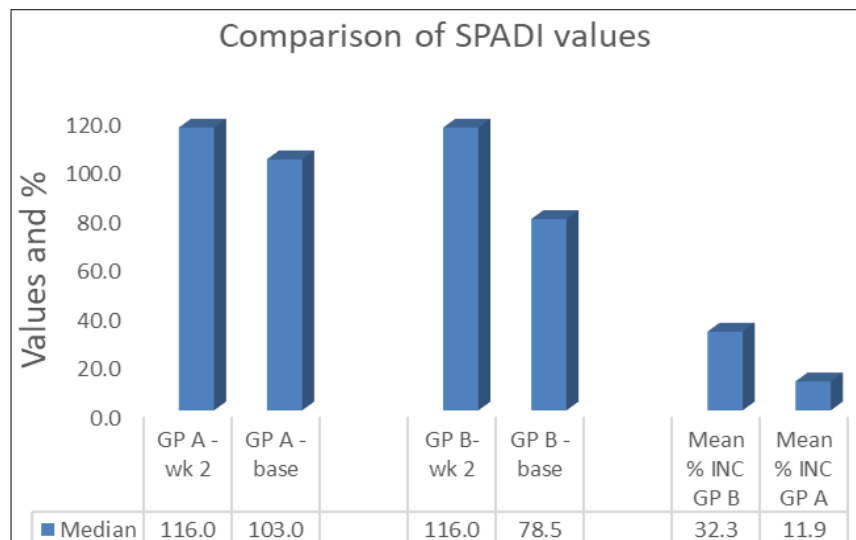


Fig 2: Comparing the SPADI scores between the Base and Week 2 groups in Group A and B

Figure 2 demonstrates the considerable difference between the Base and Week 2 Mean SPADI values. The Mean SPADI Base value [116] and the Mean SPADI Value for Week 2 [103] are both considerably less. As a result, the SPADI levels are successfully decreased by the intervention applied in Group A with $t = 13.24$ at $p = 0.01$.

The mean SPADI value for week two [78.5] is much less than the mean SPADI value for the base period [116] with $t = 16.12$ at $p = 0.01$ as depicted in figure 2. The SPADI levels are greatly decreased as a result of the intervention utilised in Group B.

There is considerable difference between the mean SPADI percent DEC values in groups A and B. The mean SPADI percent decrease in Group B (32.3%) is substantially higher than the mean SPADI percent decrease in Group A (11.9%) with $t = 9.40$ at $p = 0.01$ as shown in figure 2. Therefore, compared to Group A, the intervention adopted in Group B is more effective at lowering NPRS levels.

Discussion

According to the research on MRT for shoulder joint pathology and leprosy, MRT produces an oscillating rhythm that increases lymphatic venous perfusion of the extracellular space, resulting in anti-edematous effects [10]. According to the findings of this study, MRT is effective for treating symptoms such as increased range of motion, increased muscular strength, and decreased pain. It provides long-term advantages in terms of physical well-being, functional outcomes, and joy for patients with leprosy and locked shoulder. MRT has a greater and more rapid effect on improving range of motion (ROM) in a variety of pathological and chronic diseases when compared to other traditional therapy methods with a singular treatment configuration [11].

MRT is known to support appropriate intracellular and extracellular physiologic logistics by preserving the normal pH of tissues through micromobilization with the applicator. There is evidence that increased microcirculation within tissues improves metabolic waste clearance, oedema reduction, and soft tissue extensibility [12]. The effectiveness of MRT in terms of muscle extensibility and relaxation has

been demonstrated, found good results in both group A and group B, but in group B, where MRT was applied in addition to conventional therapy, better and faster outcomes were obtained, as measured by the NPRS value, which decreased significantly in group B and the SPADI value in week 2, which is significantly lower than in week 1. MRT offers a better and faster outcome than other modalities and conventional therapy for reducing pain and limiting ROM and enhancing quality of life, which is not found with other modalities and conventional therapies [13]. As MRT provide natural vibration promotes skeletal muscle circulation, provides oxygen and adenosine triphosphate (ATP), and aids in ROM and pain reduction. Previous research has shown that MRT increases blood circulation by 35% have investigated the impact of MRT on pain levels, sleep patterns, and spine flexibility in patients suffering from low back pain [14]. The findings of this study, showed that MRT is more effective in reducing pain and increasing flexibility than conservative therapy alone is in line with the results of the current study.

Another study done by Pattanshetty RB *et al.* (2023) [15] on effectiveness of MRT on shoulder pain and stiffness in Lymphedema Patient secondary to breast cancer revealed MRT significantly increased blood flow and decrease lymph accumulation in the area where it was used, which could be due to extrinsic pumping from vasomotion. MRT reduced pain and increased ROM, which could be attributed to soft tissue remodelling and neuromuscular dynamic control over the newly gained ROM. As a result, patients were advised to do stretching and strengthening exercises at home to maintain their range of motion [16].

The MRT device is thought to be compatible with the muscle's natural vibration frequency, which is thought to contribute to MRT's therapeutic effectiveness [17]. The current study findings revealed a significant decrease in NPRS and SPADI scores with MRT delivered along with conventional therapy.

Conclusion

The results of this study showed that both therapies were efficient in the management of pain and disability. The

MRT is more effective than other conventional therapy alone for alleviating the afflicted shoulder joint pain and related disability. According to the study, MRT The is efficient in treating frozen shoulder in terms of pain and quality of life. MRT The showed promising outcomes in decreasing shoulder pain and lowering discomfort by 30%.

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