

## Effects of Matrix Rhythm Therapy in Patients with Supraspinatus Tendinitis

Dr. Tushar J. Palekar<sup>1</sup>, Preeti Shrisunder<sup>2\*</sup>, Dr. Soumik Basu<sup>3</sup>,  
Dr. Pramod Palekar<sup>4</sup>, Sneha Nemade<sup>5</sup>

Received: 09- June -2023

Revised: 17- July -2023

Accepted: 02- August -2023

<sup>1</sup> Principal, Dr. D.Y.Patil College Of Physiotherapy, Dr. D. Y. Patil Vidhyapeeth, Pune, India

<sup>2</sup> PG, Dr. D.Y.Patil College Of Physiotherapy, Dr. D. Y. Patil Vidhyapeeth, Pune, India

<sup>3</sup> Associate Professor, Dr. D.Y.Patil College Of Physiotherapy, Dr. D. Y. Patil Vidhyapeeth, Pune, India

<sup>4</sup> Associate Professor, Dr. D.Y.Patil College Of Physiotherapy, Dr. D. Y. Patil Vidhyapeeth, Pune, India

<sup>5</sup> PG, Dr. D.Y.Patil College Of Physiotherapy, Dr. D. Y. Patil Vidhyapeeth, Pune, India  
Email: <sup>2</sup>preeti.shrisunder98@gmail.com

### Abstract

**Background:** Shoulder pain is frequently brought on by supraspinatus tendinitis. The patients with supraspinatus tendinitis usually complain of tenderness at the supraspinatus tendon insertion and pain during shoulder movement. A painful arc and overhead reaching are the symptoms of supraspinatus tendinitis, which typically has a lesion close to the musculotendinous junction. Disorders are described by The Matrix Concept as biological processes that have "derailed" and "lost rhythm." The "Matrixmobil," a specialized device, generates a combination of mechanical and magnetic pulses in the 8–12 Hz physiological frequency range. By restoring the proper frequency and amplitude range of the relevant tissue and organs, Matrix Rhythm Therapy seeks to repair errant body rhythm in the event that perturbations to a healthy regulative function of synchronously cooperating oscillations occurs.

**Methodology:** Based on the fundamental inclusion and exclusion criteria, a total of 30 participants who had been diagnosed with supraspinatus tendinitis were recruited for the study. The participants were split into two groups: Group B received therapeutic exercise and icing, whereas Group A received matrix rhythm treatment, therapeutic exercise, and icing. Following the six sessions of matrix rhythm therapy over the course of four weeks, there were therapeutic exercises and icing. Utilizing VAS, SPADI, and shoulder ROM, the individual was evaluated both before and after.

**Result:** The study found that both the intervention group and the control group were statistically significant. The application of matrix rhythm therapy showed more efficacy on the VAS (visual analogue scale), SPADI (shoulder pain and disability index), and shoulder ROM (range of motion) when compared to the control group, according to the study.

**Conclusion:** The current investigation came to the conclusion that both matrix rhythm therapy and therapeutic activities combined with icing have favorable efficacy. Matrix rhythm therapy has been demonstrated to be more effective than therapeutic exercise alone in lowering pain, enhancing range of motion, and reducing disability in individuals with supraspinatus tendinitis..

**Keywords:** supraspinatus tendinitis, matrix rhythm therapy, VAS, SPADI

### 1. Introduction

The supraspinatus tendon is the tendon of the Rotator cuff that is most frequently injured, making tendon injuries to the shoulder one of the most prevalent issues affecting person who engage in repeated motions for work or daily living.

A section of the rotator cuff, the supraspinatus muscle, emerges from the back of the scapula, above the level of the scapular spine, and inserts on the greater tuberosity of the humerus, partially fusing with the tendon of the infraspinatus muscle.

The supraspinatus muscular tendon is a specialized nonhomogeneous structure that is responsive to both compressive and tensile force. A muscle tendon that is inflamed and painful to varied degrees is said to have tendinitis.

The inflammation of the supraspinatus tendon is frequently linked to shoulder impingement syndrome. <sup>(1)</sup>With a prevalence rate of 6.1% in women and 4.5% in men, shoulder tendonitis affects more women than males. <sup>(2)</sup>

Shoulder pain is frequently brought on by supraspinatus tendinitis. The patients with supraspinatus tendinitis usually complain of tenderness at the supraspinatus tendon insertion and pain during shoulder movement such as abduction and extension against resistance are among the symptoms. <sup>(3)</sup>

A painful arc and overhead reaching are the symptoms of supraspinatus tendinitis, which typically has a lesion close to the musculotendinous junction. <sup>(4)</sup>

Supraspinatus tendinopathies are thought to be caused by a number of intrinsic and extrinsic causes. Intrinsic variables like "age" tendons lose flexibility, strength, and resistance to tensile loads as they get older. Next to vascularization. Although Codman noted a region of the supraspinatus tendon with limited blood supply in minor rotator cuff tendon injuries and chronic tendinopathies of the rotator cuff, there is evidence of extensive neovascularization that may crowd out essential collagen, decreasing the tendons characteristics. <sup>(5)</sup>

### **MATRIX RHYTHM THERAPY**

The concept behind the "Matrix Rhythm" theory, which was first put forth by Dr. U. G. Randoll in 1996, is that any action taken on a cell, whether it be preventive, therapeutic, regenerative, or even destructive, has an impact on the cell's surrounds primarily through the extracellular matrix.

Virchow states that moving forward, in order to treat disease, we must concentrate on the cells and its processes by which it interacts with its surrounding "extracellular matrix."

Matrix Rhythm Therapy provides the normal physiologic muscle frequency from the outside. By restoring the proper frequency and amplitude range of the relevant tissue and organs, Matrix Rhythm Therapy seeks to repair errant body rhythm in the event that perturbations to a healthy regulative function of synchronously cooperating oscillations occurs. <sup>(6)</sup>

The "Matrixmobil," a specialized device, creates pulses that combine magnetic and mechanical energy in the 8–12 Hz physiological frequency range. <sup>(6)</sup>Muscle pulsation frequencies outside the 8–12 Hertz range are positively connected with pains, muscle tension, and other health problems. <sup>(7)</sup>

Matrix Rhythm Therapy is proved effective on several musculoskeletal condition as it has been found supportive in tissue regeneration and healing process to reduce pain and increasing joint mobility. <sup>(7)</sup>

As there has been dearth in the literature which shows effects of Matrix Rhythm Therapy in condition related to supraspinatus muscles this study will help us to understand the effects for the same.

## **2. Methodology**

Participants in this comparative study design were chosen after the institutional ethical committee approved their recruitment. The Dr. D.Y. Patil College of Physiotherapy OPD in Pimpri, Pune, was used to find participants. The participants who met the inclusion and exclusion criteria were chosen using the chit method and split into two groups: Group A (therapeutic activities and matrix rhythm therapy) and Group B (matrix rhythm therapy alone). A signed consent and Covid-19 consent was taken from all the participants before proceeding further. Participants were assessed at base line using VAS, SPADI and Shoulder ROM for flexion, abduction and internal rotation and after the completion of 6 session of matrix rhythm therapy for 4 weeks along with therapeutic exercise.

### **Inclusion Criteria:**

25 to 40 years of age

Both male and female genders

Patient diagnosed by the orthopedic surgeon

Positive painful arc of movement during shoulder flexion and abduction

### **Exclusion Criteria:**

Open, deep cuts on the shoulder

Disorders of the peripheral arteries

Broken shoulders

Ventricular pacemakers

A dislocated shoulder

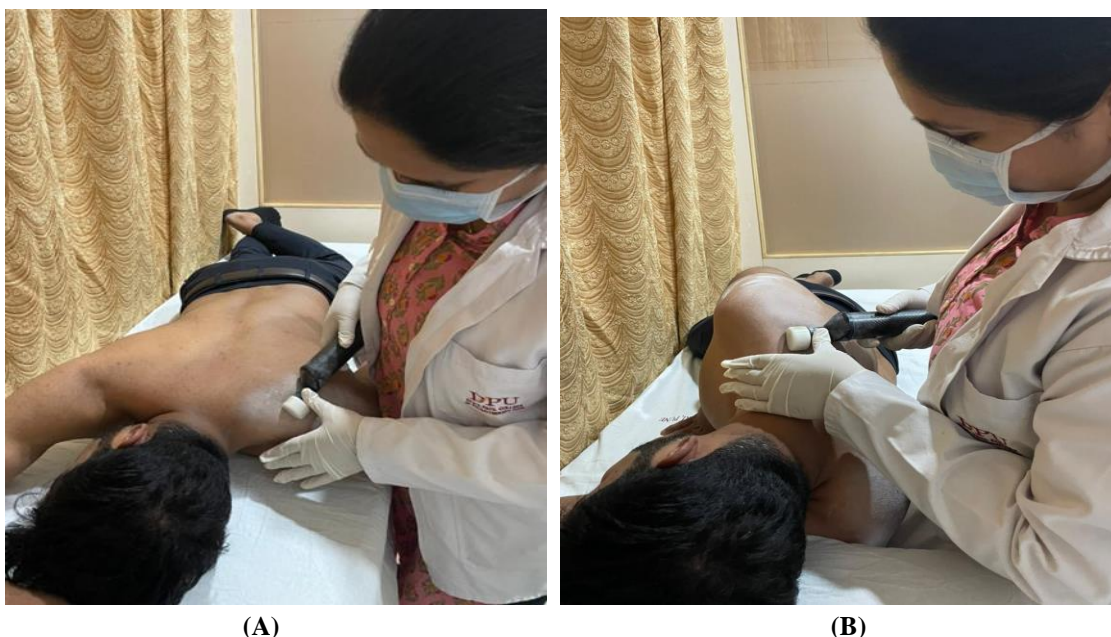
Outcome measures:

1. Visual analogue scale.
2. Shoulder pain and disability index.
3. Shoulder ROM for flexion, abduction, and internal rotation.

Intervention for group A: Participants received 30 minutes of matrix rhythm therapy, with the vibrational frequency maintained between 8 and 12 Hz.

The supraspinatus muscle was the primary target of the matrix rhythm therapy, which also covered the trapezius, deltoid, and infraspinatus muscles.

Participants received six session of matrix rhythm therapy in four weeks with therapeutic exercises and ice pack.



**Figure A and B:** Application of Matrix Rhythm Therapy on the participant.

Intervention for Group B: The exercise was to be performed by the participants in three sets of 10 repetitions each, five days a week, for four weeks (two sessions of home exercises covering the same exercises were taught to the participants in addition to three supervised sessions with a physiotherapist). There was to be a one-minute rest period in between each set. Therapeutic exercises such as:

Active assisted range of motion (A-AROM) of the shoulder using a cane or stick, shoulder pendulum exercise, full can arm elevation exercise, empty can exercise, and horizontal abduction exercise are some examples of therapeutic exercises. Passive range of motion (ROM) of the shoulder joint in pain-free range covers shoulder flexion, shoulder abduction, and shoulder internal rotation.

### 3. Result

The study reported statistically significant regarding both the groups, the intervention group, and the control group. The study revealed more effectiveness in VAS (visual analogue scale), SPADI (shoulder pain and disability index) and shoulder ROM (range of motion) after application of matrix rhythm therapy by having higher mean difference compared to control group.

The statistical program SPSS 26.0 (SPSS Inc., Chicago, IL) was used to analyze the data, and the level of significance was set at  $p < 0.05$ . To evaluate the mean and standard deviation of the respective groups, descriptive statistics were used. Shapiro Wilkinson test was used to determine whether the data was normal. Using MANN

WHITNEY U/INDEPENDENT T TEST and PAIRED T TEST, inferential statistics were used to determine if the groups differed from one another.

**Table 1: Overall Result- Intervention**

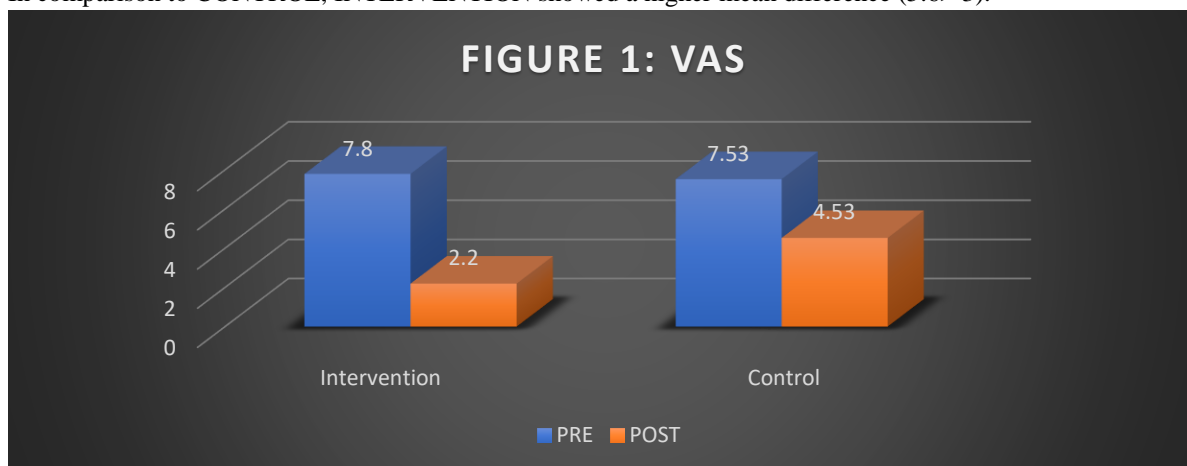
		Mean	SD	SEM	MEAN DIFFERENCE	T TEST	P VALUE
VAS	PRE	7.8	0.65	0.05	5.6	23.95	0.0001*
	POST	2.2	0.65	0.07			
SPADI	PRE	51.75	2.72	0.46	38.25	51.87	0.0001*
	POST	13.23	1.06	0.55			
SHOULDER FLEXION	PRE	106.94	11.83	2.92	63.06	17.27	0.0001*
	POST	170	7.97	1.03			
SHOULDER ABDUCTION	PRE	108.67	12.75	1.74	63.87	18.35	0.0001*
	POST	172.54	6.72	1.04			
INTERNAL ROTATION	PRE	39.8	9.59	2.21	33.67	8.83	0.0001*
	POST	73.46	11.31	1.78			

**Table 2: Overall Result- Control**

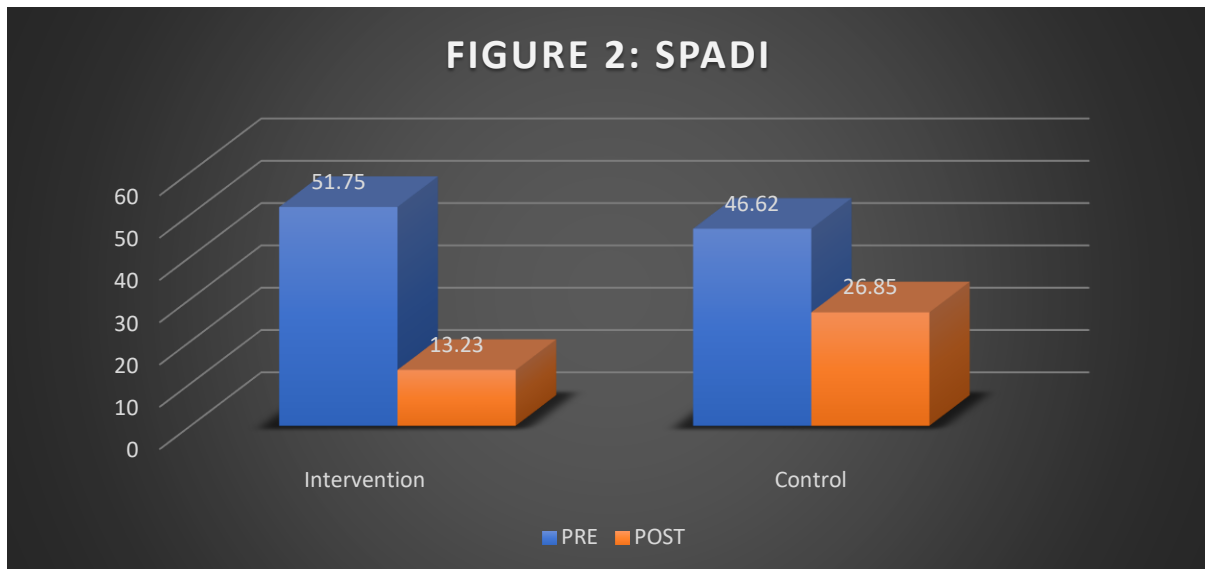
		Mean	SD	SEM	MEAN DIFFERENCE	T TEST	P VALUE
VAS	PRE	7.53	0.71	0.19	3	12.41	0.0001*
	POST	4.53	0.61	0.21			
SPADI	PRE	46.62	6.31	0.46	19.27	10.27	0.0001*
	POST	26.85	4.25	0.55			
SHOULDER FLEXION	PRE	100.26	9.34	1.74	48.21	14.44	0.0001*
	POST	148.47	9.54	1.04			
SHOULDER ABDUCTION	PRE	103.8	10.39	2.01	48.54	14.35	0.0001*
	POST	152.34	8.03	1.65			
INTERNAL ROTATION	PRE	31.06	8.37	2.33	22.76	5.66	0.0001*
	POST	53.73	7.69	1.75			

**Inference:**

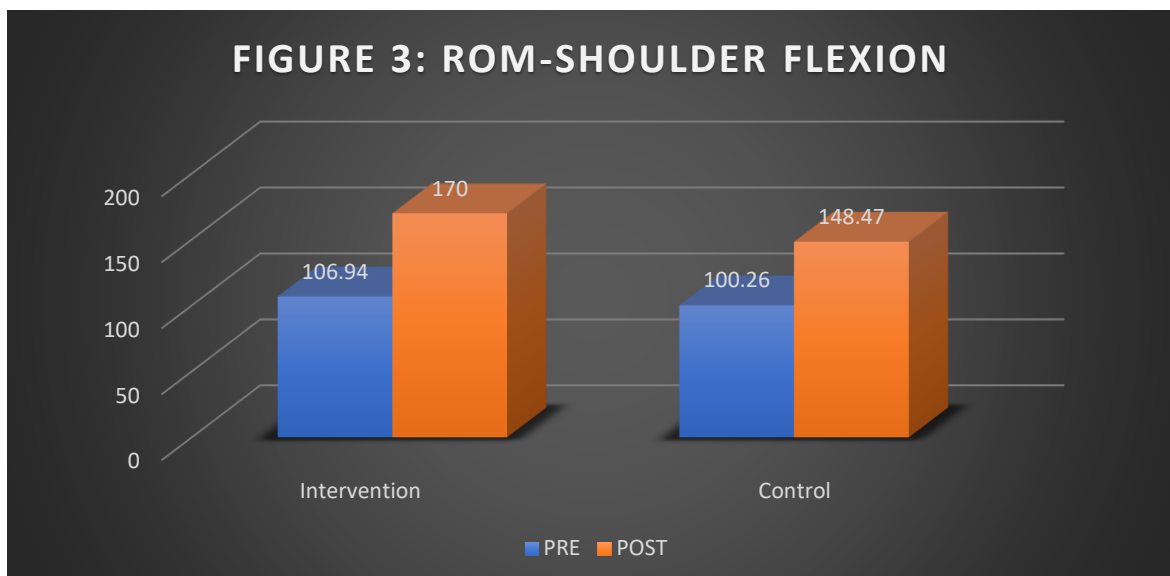
1. VAS: Table 1 and Figure 1 show the VAS (Pre-Post), and Independent T Test between-group analysis revealed a statistically significant difference in relation to the POST interval (P 0.05). For both INTERVENTION & CONTROL, the results of the within-group analysis using the Paired t test were statistically significant (P 0.05). In comparison to CONTROL, INTERVENTION showed a higher mean difference (5.6> 3).



1. SPADI: In table 1, table 2, and figure 2, SPADI is indicated. A between-group study using an independent T test revealed a statistically significant difference with respect to the PRE & POST interval (P 0.05). For both INTERVENTION & CONTROL, the results of the within-group analysis using the Paired t test were statistically significant (P 0.05). In comparison to CONTROL, INTERVENTION showed a higher Mean Difference (38.25>19.77).

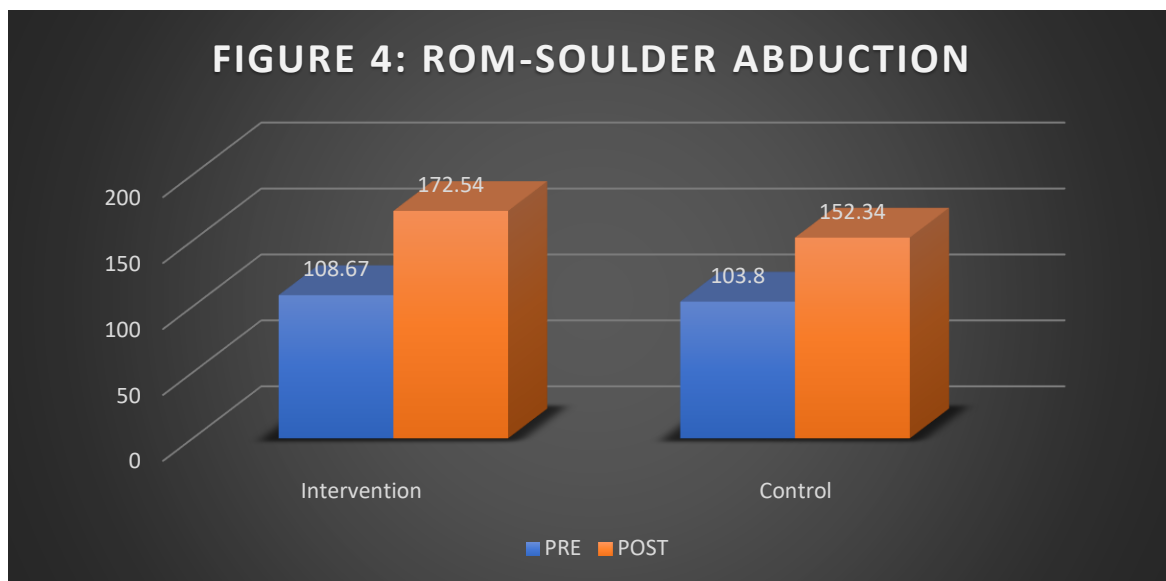


1. Shoulder flexion: SHOULDER FLEXION was indicated in tables 1, 2, and 3; a between-group analysis using an independent T test revealed a statistically significant difference in relation to the POST interval (P 0.05). The results of the Paired T test's within-group analysis were statistically significant for both the INTERVENTION and the CONTROL (P 0.05). The mean difference between CONTROL and INTERVENTION was higher (63.06>48.21).

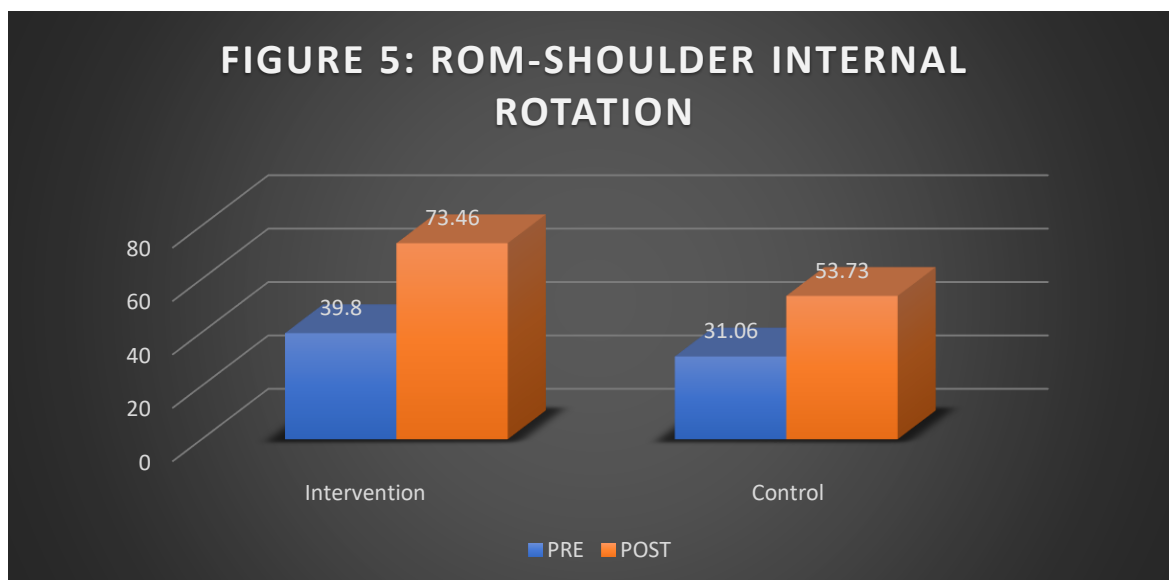


1. Shoulder abduction: SHOULDER ABDUCTION was mentioned in tables 1, 2, and 4; a between-group analysis by an independent T test revealed a statistically significant difference in relation to the POST interval (P 0.05). For both INTERVENTION & CONTROL, the results of the within-group analysis using the Paired t test were

statistically significant ( $P < 0.05$ ). In comparison to CONTROL, INTERVENTION had a higher mean difference ( $63.87 > 48.54$ ).



1. Shoulder internal rotation: In table 1, table 2 and fig 5 indicates SHOULDER ABDUCTION, between group analysis by Independent T Test reported Statistically Significant difference with respect to PRE & POST interval ( $P < 0.05$ ). Within group analysis by Paired t test reported Statistically Significant result regarding both INTERVENTION & CONTROL ( $P < 0.05$ ). Higher Mean Difference was observed in INTERVENTION than CONTROL ( $33.66 > 22.76$ ).



**4. Discussion**

The current study's objective was to evaluate the efficacy of matrix rhythm therapy in treating supraspinatus tendonitis in patients between the ages of 25 and 40. The study found that both the intervention group and the control group were statistically significant. The application of matrix rhythm therapy showed more efficacy on the VAS (visual analogue scale), SPADI (shoulder pain and disability index), and shoulder ROM (range of motion) when compared to the control group, according to the study.

The result showed that matrix rhythm therapy combined with therapeutic exercises and icing is statistically more significant than therapeutic exercises along with icing alone in reducing pain, shoulder disability and improving shoulder range of motion

According to the findings, the VAS score significantly decreased for both the intervention group and the control group.

But compared to the control group, interventional group showed much significant improvement in the VAS score. The mean difference of pre-test VAS was 7.8 and post-test was 2.2 of intervention group and in control group the mean difference of pre-test was 7.53 and post-test was 4.53. clinically significant pain relief was experienced by both treatment groups, as evidenced by a lower post-treatment pain VAS score.

The study also revealed significant improvement in the SPADI (shoulder pain and disability) score in both the groups, but showed much greater improvement in the intervention group. In the intervention group, the mean difference between the pre-test and post-test SPADI was 51.75, whereas in the control group, it was 46.62 and 26.85. There was clinically significant improvement in the disability in both the groups but showed greater improvement in the disability of the intervention group.

Shoulder ranges of motion such flexion, abduction, and internal rotation demonstrated clinical importance in the improvement of the ranges in both groups, intervention and control, for the functional alterations in the shoulder's mobility. The intervention group showed much great improvement compared to the control group with higher mean difference.

Varun Naik et al.'s study from 2017 found that, when compared to other conventional treatments, Matrix rhythm therapy shows a larger and faster improvement in recovering damaged shoulder joint ROM and subsequently lowering pain in frozen shoulder patients. <sup>(8)</sup>

In a case study on the effect of a physiotherapy rehabilitation program on post-operative stiffness of supraspinatus tendinitis in the year 2020, Mudhumita Yadav et al. set out to reduce pain and inflammation while boosting strength and range of motion. Graded exercises was administered to the patient in three different phases to reduce pain and improve mobility. According to the study's findings, patients with supraspinatus tendonitis benefit greatly from physiotherapy, and graded exercises can effectively treat a chronic condition brought on by a traumatic etiology. <sup>(9)</sup>

The current study has revealed that matrix rhythm therapy and therapeutic exercises with icing is been effective than using traditional method by performing therapeutic exercise and icing alone in treating patients with supraspinatus tendinitis. The effects seen after application of matrix which helped in reducing pain, improve range of motion of shoulder and improving disability helped in faster recovery of the patient.

Conclusion: The current study found that individuals with supraspinatus tendinitis who underwent matrix rhythm therapy, therapeutic exercises, and icing either individually or in conjunction with one another were able to manage their impairment and experience pain relief and improved range of motion. Although both groups exhibited progress, matrix rhythm therapy was found to be more effective than therapeutic exercises alone in lowering pain, enhancing range of motion, and reducing patients' impairment.

## References

1. Yadav M, Thombare N, Naqvi W, Bele A. Impact of Physiotherapy Rehabilitation Program on Post-Operative Stiffness of Supraspinatus Tendinitis. *J Evol Med Dent Sci*. 2020 Aug 17;9:2403–5.
2. Walker-Bone K, Palmer KT, Reading I, Coggon D, Cooper C. Prevalence and impact of musculoskeletal disorders of the upper limb in the general population. *Arthritis care & research*. 2004 Aug 15;51(4):642-51.
3. Lee HW, Kim JY, Park CW, Haotian B, Lee GW, Noh KC. Comparison of Extracorporeal Shock Wave Therapy and Ultrasound-Guided Shoulder Injection Therapy in Patients with Supraspinatus Tendinitis. *Clin Orthop Surg*. 2022 Dec 1;14(4):585–92.
4. Kisner, Carolyn., Colby, Lynn Allen. *Therapeutic Exercise: Foundations and Techniques*. Thailand: F.A. Davis, 2012.
5. Spargoli G. SUPRASPINATUS TENDON PATHOMECHANICS: A CURRENT CONCEPTS REVIEW. *Int J Sports Phys Ther*. 2018 Dec;13(6):1083–94.
6. Mishra P, Jayavel A, V.P.R S. Reliability and Sensitivity of Shuttle Walk Test in Chronic Mechanical Low Back Pain Patients. *Indian J Physiother Occup Ther*. 2021 Feb 3;
7. Shrivastava S, S AK. An Overview of Matrix Rhythm Concept and Efficacy of Matrix Rhythm Therapy in Pathological Conditions. *Int J Health Sci Pharm IJHSP*. 2019 Apr 20;3(1):25–30.

8. Naik V, Bhagwat S, Pathania T, Bootwala F. Effectiveness of matrix rhythm therapy in frozen shoulder with respect to ROM and pain- An experimental study.
9. Yadav M, Thombare N, Naqvi W, Bele A. Impact of Physiotherapy Rehabilitation Program on Post-Operative Stiffness of Supraspinatus Tendinitis. J Evol Med Dent Sci. 2020 Aug 17;9:2403–5.