

A STUDY ON EFFICACY OF RUSSIAN CURRENT WITH SHOULDER EXERCISES TO IMPROVE SHOULDER ABDUCTION IN PERIARTHRITIS OF SHOULDER

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Abstract

Periarthritis of the shoulder is a chronic, inflammatory disorder of the shoulder and surrounding soft tissues. This condition is frequently caused by injury, leading to pain and lack of use. **Objective:** Russian currents with shoulder exercises can reduce pain, improve shoulder abduction range in patients with periarthritis of shoulder. **Design:** Experimental study. Participants were in Saveetha Medical college hospital Chennai, (n=60, age range= 35 to 70 years). **Results:** The two-tailed P value is less than 0.0001 by conventional criteria this difference is considered to be extremely statistically significant in experimental group. **Conclusion:** Russian currents with shoulder exercises could be effective intervention in the reduction of pain, increase the shoulder abduction range in periarthritis of shoulder.

Key words: Russian current, periarthritis

I. INTRODUCTION:

Periarthritis shoulder involving the periarticular soft tissues of the shoulder and characterized by an insidious and progressive loss of active and passive mobility in the glenohumeral joint presumably due to capsular contracture. (Codman, 1945) .Codman coined the term “adhesive capsulitis”. Periarthritis shoulder is often more prevalent in women than men, with a female to male ratio of about 1.4:1. Menopauses is often reported as a cause of periarthritis shoulder. (Rechard D et al,2005) .It is usually seen in 40-65 years old, and with an occurrence rate of approximately 2-5% in the general population, (Kelley M et al,2009), It is a common problem in our country in the 5th and 6th decades of life. Three subcategories of secondary frozen shoulder include systemic (diabetes mellitus and other metabolic conditions), extrinsic (cardiopulmonary disease, cervical disc, CVA, humerus fractures, Parkinson’s disease), and intrinsic factors (rotator cuff pathologies, biceps tendonitis, calcific tendonitis). In many physical therapy programs, mobilization techniques are an important part of the intervention. The neurophysiologic effect is based on the stimulation of peripheral mechanoreceptors and the inhibition of nociceptors. It is a form of passive movement in a broad spectrum of exercise used to treat painful and stiff synovial joints. Russian currents and exercise to improve the shoulder abduction range of motion, and pain, in subjects with periarthritis shoulder. Russian current was applied at range of medium frequencies and it was found that as the stimulating frequency increased, there was and it was greater comfort for the patient. This type of current stimulation more effective for voluntary contraction of muscle and relieve pain in periarthritis of shoulder. Short-wave diathermy (SWD) is a deep tissue heating electrotherapeutic modality, which produces an oscillating electromagnetic field in the frequency range of 27.12 MHz.

II. OBJECTIVES OF STUDY:

To find out whether application of Russian current and supervised exercises can reduce pain, improve range of motion in patients with periarthritis of shoulder.

III. MATERIALS & METHODS:

The study is experimental in nature. A randomly selected sample of sixty subjects was divided into two groups. They were treated with Russian current, shortwave diathermy, supervised exercise.

3.1 Methodology:

60 asymptomatic healthy individuals fulfilling the inclusion criteria will be selected and randomly divided into two groups. Group A and Group B, each group will consist of 30 members. Informed consent will be obtained from them. Pre test will be conducted on group A and group B by using Goniometer for active range of motion of shoulder abduction. Visual analogue scale will be used for pain assessment for both group A and group B Abduction range of motion was measured actively using standard Goniometer according to the method as described by Lippmann (1943). The stationary arm of the Goniometer was

placed parallel to the midline of the thorax, the axis of motion was 2cm distal to the posterior aspect of the acromion process and the motion arm of the Goniometer was placed over the posterior aspect of the humerus and aligned to the olecranon process of the humerus. Visual analogue scale will be used for pain assessment. Visual analogue scale consists of 10 cm horizontal line with 2 end points, labeled no pain and worst pain respectively. The patient is requested to place a mark on the 10 cm line to know his pain intensity at that particular time the distance in cm from the lower end of VAS to the patients mark is used as a numerical index of the severity of pain. Group A subjects will receive Russian current, and supervised exercise program. Group B subject will receive shortwave diathermy and supervised exercise program only. Collective data will be analyzed by standard deviation and unpaired 't' test. Post test will be conducted on group A and group B by goniometry for active range of motion in shoulder abduction, Visual analogue scale will be used for pain assessment. The results will be recorded and analyzed after 10 days.

3.2 PROCEDURE:

Sixty subjects both male and female between the age group of 40 and 60 were selected from Saveetha medical college hospital Department of physiotherapy. All subjects were diagnosed by physical therapist and they were checked for the global restriction at shoulder joint after the initial assessment, written informed consent forms were obtained from the participants who include in inclusion criteria. The inclusion criteria of the study were age between 40 to 60 years, shoulder range of motion restriction, pain more than two months. All the patients were having global restriction of shoulder joint range of motion, that is, movements of shoulder were restricted in shoulder in all direction. The selected candidates were randomly allocated to two different groups experimental (Group A) and control (Group B) each having 30 participants.

3.3 INCLUSION AND EXCLUSION CRITERIA:

Inclusion criteria

- Informed consent
- Males and Females
- Age groups of 40-60 years
- Painful shoulder for at least 3 months
- Painful restriction of more than 50% of active and passive range of motion of the shoulder

Exclusion criteria

- Tear Of Rotator Cuff
- Calcific Tendonitis
- History Of Any Trauma, Fracture or Dislocation
- Rheumatoid Arthritis
- Osteoarthritis
- Osteoporosis
- Malignancies
- Sympathetic Dystrophy
- Extrinsic problems such as neuro-muscular disorders or referred pain from cervical disc prolapse with radiculopathy.
- Previous history of shoulder surgery.
- Musculoskeletal disorder with hyper mobility.
- Unstable angina
- Local corticosteroid injection

Materials: Goniometer, VAS - Pain Scale

Russian current: Experimental Group A ($n = 30$) was treated with Russian current and supervised exercises. Russian current frequency of 2500 HZ, pulse rate: 50 to 70 Hz, pulse duration 150 – 175 us for 15 minutes of treatment was given.

Shortwave diathermy: Control Group B ($n = 30$) was treated with Shortwave diathermy and supervised exercises. Patient was positioned in supine lying and short wave diathermy pads were applied in contra planner (AP) method for 20 minutes on affected shoulder¹¹. The spacing between the pads and treatment part is maintained by the placing of eight folded towels. Intensity was maintained and adjusted to produce comfortable warmth based on patient's feedback. Supervised exercise program was explained and patients were required to repeat all these exercises at centre under supervision of the therapist. Intervention consisted of the Codman exercise, shoulder wheel exercises self-stretching exercises, wall-ladder exercises and overhead pulley exercise.

This intervention was given to the experimental as well as the control group. Intervention consisted of the Codman exercise, shoulder wheel exercises, wall-ladder exercises, overhead pulley, self stretching exercises. Codman's exercise was first

started with 10-15 repetitions without any weights and follow by shoulder wheel exercises, wall ladder and overhead pulley are repeated 10-15 times. All these exercises were first demonstrated to the patient and then were asked to repeat the same. After the patient were given capsular stretching for the posterior and anterior part of the capsule with 20 seconds hold in order to maintain the stretched position. The data from both the groups will then be analyzed and compared using statistical procedures.

IV. STATISTICAL ANALYSIS:

The Data was calculated and tabulated. Paired t-test was used to analyze the result within the group and unpaired t-test was used as to analyze the result between the groups.

V. RESULTS:

The comparative mean values, mean difference, standard deviation and unpaired t –value between Pre – test versus post – test value of Pain and Abduction range of motion for Periarthritis shoulder.

Table – 1: Pre score analysis of pain and Range of motion for Group A and B

S.NO	Statistical measurement	GROUP A		GROUP B	
		PAIN	ROM	PAIN	ROM
1.	Mean	9.33	59.33	7.6	60.33
2.	Standard deviation	10.99	12.84	1.248	12.48

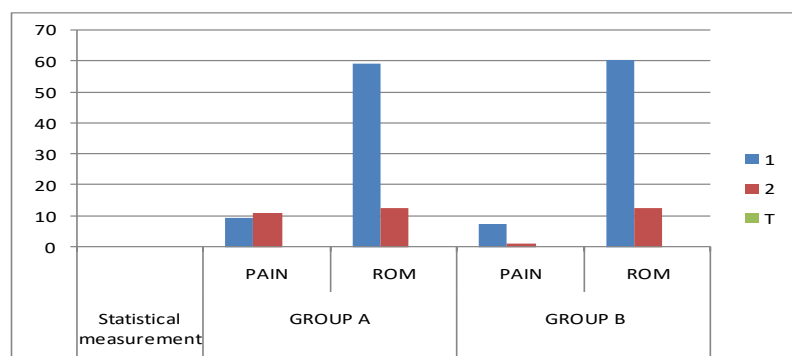
Table.2 Post score analysis of pain and Range of motion for both groups

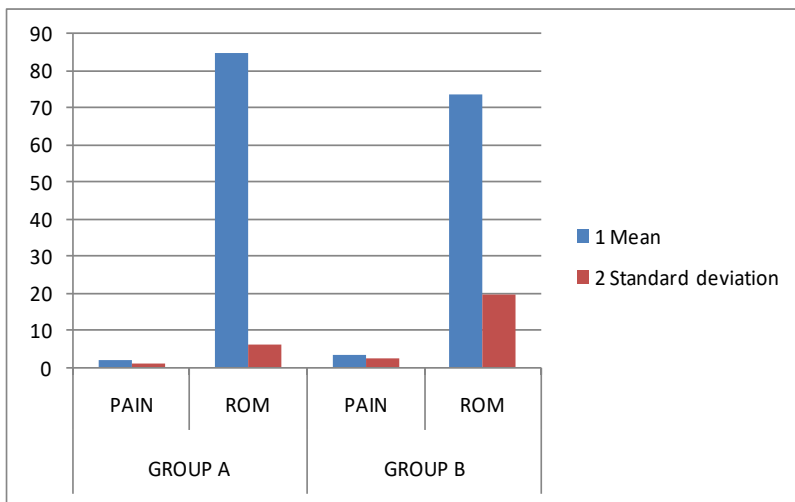
S.No.	Measurement	GROUP A		GROUP B	
		PAIN	ROM	PAIN	ROM
1.	Mean	1.66	84.66	3.36	73.66
2.	Standard deviation	0.84	5.86	2.37	19.78

Table.3 Unpaired “t test” values of pain and ROM:

S.NO	Variables	t value	difference	standard error of difference	results
1.	PAIN	t = 3.7011	df=58	0.45	SIGNIFICANT
2.	ROM	t = 2.9188	df = 58	3.76	SIGNIFICANT

PRE SCORE:



POST SCORE:**VI. RESULTS AND DISCUSSION:**

This study was designed to know the efficacy of Russian current with exercises in the treatment of periarthritis shoulder by comparing with conventional treatment of Shortwave diathermy with exercises. While analyzing the outcome measurement, both group show significant improvement. Statistical analysis of the data in pre- and post intervention VAS values show that extremely statistical significant in group A than group B. Group B (control group), noticeable improvement may be due to beneficial effect of supervised exercise protocol. Many studies have claimed that exercise programme is the most effective treatment for shoulder in Periarthritis shoulder (N.Maricar et al., 2009), Exercises within pain free range also move the synovial fluid, thus decrease inflammation and decreased pain (A.K.Biswas et al., 1979). Both groups received Codman's exercises. Russian current was effective to reduction of pain and increased muscle strength. It also relieves pain through the neurophysiologic and mechanical effect (C.Kisner, 2002). Both groups improved significantly in range of motion mainly Abduction range. But Group A (Experimental group) shows a statistically significant improvement in range of motion than Group B. This result supports the findings showing improvement after exercises in periarthritis shoulder (J.F.Chen et al., 2009). Group A (experimental group) received Russian current additionally so this may be the reason of greater improvement compare to Group B. This result correlates with previous studies, which studied the effects of Russian current and exercises on subjects of periarthritis shoulder and found that besides pain and range of motion function also improved.

Results of this study after analysis were directed towards the conclusion that Russian current with supervised exercise protocol more effective for treating periarthritis shoulder as the experimental group (Group A) has shown extremely statistically significant improvement than the control group (Group B) in all outcome parameters. The results were significant at $p = 0.005$ with 95% confidence interval in between the group for pain intensity, and the abduction range of motion of shoulder. These results strongly support the findings of study (N.Maricar et al., 2009) that investigated the shoulder motion and pain by using Russian current and exercises on single case design and concluded that abduction movements improved.

Recommendations and limitations:

This study can be conducted further in following manners.

1. Increase the time duration of the study.
2. Increase the sample values.
3. More settings and long duration of the study and will help to further improvement of the study.
4. Number of subjects was less.
5. No groups had similar patients with the same degree of involvement.

6. Age variation was there from 40-60 years

7. Patients built was variable

VII. CONCLUSION:

In this study concluded that Russian current of the shoulder must be added to the supervised exercise program to achieve goals of reducing pain improving range of motion consequently improvement in daily functional activities. Thus Russian current with exercises using resulted in significant improvement in increase the range of motion and decrease the pain and to helpful treatment of the Periarthritis Shoulder

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