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Original research article

Effectiveness Of Cryokinetics In Comparison With Effectiveness Of Ultrasound Therapy In Treatment Of Acute Supraspinatus Tendinitis

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Abstract

Supraspinatus tendinitis or painful arc syndrome occurs in the shoulder. The shoulder joint owes its stability to the rotator cuff muscles which are four small muscles located around the shoulder joint which help movement, but importantly their tend on stabilize the head of the humerus within the joint capsule.as it is the most common overuse injury we have compared the effectiveness of Cryokinetics and Ultrasound therapy in treating supraspinatus tendinitis as measured by Visual analogue Scale (VAS). For the study 60 patients with acute supraspinatus tendinitis was taken by dividing it in two group A and group B, having equal patients. The results of VAS scale outcome based on the difference of pre and post assessment score is found significantly higher in Group A, revealing the effectiveness of cryokinetics in comparison with effectiveness of ultrasound therapy in treatment of acute supraspinatus tendinitis.
Keywords: Effectiveness, cryokinetics, ultrasound, acute supraspinatus tendinitis

Introduction

Supraspinatus tendinitis was proposed by NEER[3] in 1972 as a clinical entity in which the rotator cuff was pathologically compressed against

- Anterior structure of coraco-acromial arch.
- Anterior third of the acromion.
- The coraco acromial ligament.
- Aacromio clavicular joint.

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Supraspinatus probably had the most written on it in regards to the impingement syndrome and related shoulder pathology. It can be affected by trauma but also undergoes chronic degenerative changes leading to tendinopathies and rupture[1].

Background

Shoulder pain is the third most common cause of muscular skeletal disorder after low back pain and cervical pain. The annual incidence is estimated at 10 cases per 1000 population, peaking at 25 cases per 1000 population in an age category of 42-46 years.

The treatment of SST is mainly aimed at elevation of pain. Although nonsteroidal anti-inflammatory drugs (NSAIDS) are widely used to treat the pain with SST, the high incidence of side effects with NSAIDS can limit their use. To avoid or to reduce the side effects associated with NSAIDS, physical therapy such as Cryokinetics, ultrasound therapy, short wave diathermy, laser are frequently used. It has been cited that use of cryotherapy and US has been proven to control the pain and to prevent disability.

Supraspinatus tendinitis is a painful lesion of the supraspinatus tendon; here the pain is located over the lateral aspect of arm with well-defined trigger points on the muscle belly over the supraspinatus notch and at the insertion.

A narrowing of the subacromial outlet by spur formation in coraco acromial ligament and the under surface of the anterior third of acromion define the relative progression of the impingement syndrome[2]. All of these factors results in increase in pressure on the rotator cuff, which can lead to chronic wearing and subsequent tearing of the rotator cuff tendon.

Shoulder pain is the 3rd most common cause of musculoskeletal disorder after low back pain and cervical pain. The annual incidence is estimated at 10 cases per 1000 population, peaking at 25 cases per 1000 population in a age category of 42-46 years[4-5].In cadaver studies, the incidence of full thickness tear varies from 18-26%. The incidence of partial thickness tear varies from 32-37% after age 40 years. In a study it is found that both males and females are equally affected with supraspinatus tendinitis. Rotator cuff disease is more common after age of 40 years.

Many physiotherapy treatments are in use for or in treatment of Supraspinatus tendinitis. Some of them are:

- Hot/Cold pack application.
- Ultra sound therapy.
- Iontophoresis/phonophoresis.
- Deep friction massage.
- Low level laser therapy.
- Short wave diathermy.

Aim of the study

For this study the aim was to measure effectiveness of cryokinetics in comparison with effectiveness of ultrasound therapy in treatment of acute supraspinatus tendinitis.

Method

For this study, 60 patients with SST of both sexes were taken. Patients were randomly divided into group A and group B. Group A were treated with cryokinetics for 30 minutes. Group B were treated with US therapy for 8 minutes. Both the groups were

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treated 5 times per week for three weeks. Patients were evaluated with VAS and 1 RM on day 1st, 15th day and end of third week.
The values were compared to see which group has better improvement. The values are statistically analyzed to determine their effect in reducing pain and improving muscle strength.

Study Design: A Comparative evaluation study with 60 patients with acute Supraspinattus Tendinitis with 30 patients in Group A (CRYOKINETICS) and 30 patients in Group B (ULTRSOUND THERAPY) is undertaken to study the Effectiveness of Cryokinetics in comparison with effectiveness of Ultrasound Therapy.

Table 1: Age distribution of patients studied

Age in years	Group A		Group B	
	No	%	No	%
21-30	3	10.0	5	16.7
31-40	15	50.0	14	46.7
41-50	12	40.0	11	36.7
Total	30	100.0	30	100.0

Samples are age matched with P=0.876

Table 2: Comparison of VAS score between two groups of patients (n=30)

VAS	Day 1	Day 15	3rd week	%change at 3rd week
Group A				
No pain	0	0	6(20.0%)	+20.0%
Mild Pain	0	15(50.0%)	24(80.0%)	+80.0%
Moderate pain	12(40.0%)	14(46.7%)	0	-40.0%
Severe pain	18(60.0%)	1(3.3%)	0	-60.0%
Group B				
No pain	0	0	0	0.0
Mild Pain	0	3(10.0%)	12(40.0%)	+40.0%
Moderate pain	12(40.0%)	24(80.0%)	17(56.7%)	+16.7%
Severe pain	18(60.0%)	3(10.0%)	1(3.3%)	-56.7%

Table shows the comparison of VAS between two groups of patients. In group A on day 1st there were 12 patients with moderate pain which was measured by VAS & 18 patients with severe pain. On day 15th there were 15 patients with mild pain & 14 with moderate pain and 1 patient with severe pain. At the end of 3rd week there were 6 patients with no pain, 24 with mild pain. And in group B-on day 1st there were 12 patients with moderate pain and 16 with severe pain. On day 15th there were 3 patients with mild pain and 24 patients with moderate pain and 3 patients with severe pain. And At the end of 3rd week there were 12 patients with mild pain and 17 patients with moderate Pain and 1 with severe pain.

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Methodology

Research design

It is a Comparative Evaluation Study.

Population

Patients with acute supraspinatus tendinitis.

Sample size

60 patients with acute supraspinatus tendinitis, residing in Udaipur.

Sampling method

Random sampling method.

Sampling technique

Samples are selected through random sampling by using chit method First prepare 60 chits (30 in each group), place them in box, shuffle at each time and ask the patient to pick one chit. Whichever group selected by the patient, as found on the chit, is allocated to that patient. Do not replace the selected chits back into the box.

Source of data

All patients coming to PACIFIC MEDICAL COLLEGE AND HOSPITAL, PACIFIC COLLEGE OF PHYSIOTHERAPY with clinical diagnosis of supraspinatus tendinitis by anorthopaedician and who are fulfilling the inclusion and exclusion criteria.

Statistical software

The Statistical software namely SPSS 22.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

Inclusion criteria

1. Subjects with supraspinatus tendinitis who are under analgesics.
2. **Age group:** 30-50 yrs.

Exclusion criteria

1. Adhesive capsulitis.
2. Cervical disorders.
3. Fibromyalgia.
4. Rheumatoid Arthritis.
5. Hemiplegia.
6. Thoracic outlet syndrome.
7. Cold hyper-sensitivity, haemoglobineuria.
8. Anesthetic skin.
9. Cardiac conditions.
10. Cold utricaria.

Materials used

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- Cold pack.
- Ultrasound machine.
- Ultrasonic gel.
- VAS.
- Cotton.
- Weight cuff.
- Cord.

Results of data analysis

Table 3: Comparison of Repetitions maximum in two groups of patients

RM	Group A	Group B	P value
Day 1	0.90±0.40	1.05±0.49	0.204
Day 15	1.45±0.27	1.30±0.43	0.111
3rd week	1.97±0.39	1.47±0.39	<0.001**

The results for the comparison of repetition maximum in two groups of patients revealed that On day 1 group A had 0.90+/-0.40 and group B had 1.05+/-0.49 with a P value of 0.204, On day 15 group A had 1.45+/-0.27 and group B had 1.30+/-0.43 with p value of 0.111 and at the end of 3rd week group A had 1.97+/-0.39 and group B had 1.47+/-0.39 with value of <0.001.

In VAS scale outcome based on the difference of pre and post assessment score is more in Group A with $P < 0.001$. In 1 RM outcome based on difference of pre and post assessment score is more in Group A with $P < 0.001$.

Discussion

This study was undertaken to study the effectiveness of Cryokinetics in comparison with effectiveness of Ultrasound therapy. It is based upon the Rotator cuff injury that is one of the occupational health problems. It has on orthopedic ambulatory with high functional damage to its carrying. This study aimed to compare these two interventions in reducing pain and increasing muscle strength and enhancing functional performance in SST. It presented a comparative evaluation study with 60 patients with acute supraspinatus tendinitis was undertaken. 60 patients were divided into two groups, group A and group B. Each group consisting of 30 patients. Group A received Cryokinetics therapy and group B received ultrasound therapy. The group analysis results that Group A was treated with cryokinetics and group B was treated with US therapy. Group A has been shown more improvement than group B, which is proved statistically.

Conclusion

1. The good improvement of VAS scale is seen in Group A patients.
2. The good improvement of 1RM is seen in Group A patients
3. The study concluded that Cryokinetics gives better response and is more effective than US in reducing pain and enhancing functional performance in SST patients.
4. The good improvement of VAS and 1RM is seen in the age group of 31- 40 years.

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