



Effect of Capsular Stretch and Scapular Stabilisation Exercises on Pain and Disability among Stage II Adhesive Capsulitis

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Abstract

Introduction: Adhesive capsulitis is a clinical condition characterized by gradual onset of shoulder pain with progressive limitation of both active and passive shoulder range of motion.⁽¹⁾ Its Prevalence rate being 2% in common population. Variable treatment approaches are implemented but no evidencial support for definite protocol. Hence aim is to find the effectiveness of capsular stretch along with scapular stabilization exercises on pain and disability among stage II Adhesive Capsulitis.

Subjects: 15 subjects with Adhesive capsulitis.

Methodology: 15 subjects of both sexes between 40-50 years, diagnosed with stage II adhesive capsulitis are selected. capsular stretching was given passively by the therapist and were asked to perform scapular stabilization exercises for two weeks daily. Pain and disability by SPADI on first day before starting treatment and after 2 weeks of treatment are measured.

Results: statistical analysis done using paired t test proved that the outcome measures pain and disability showed significant difference after consecutive 2 weeks.

Conclusion: Capsular stretching and scapular stabilization exercises decreases pain and disability of shoulder.

Keywords: Capsular stretching, Scapular stabilization exercise, Adhesive Capsulitis, Range of motion.

Abbreviations:

SPADI- Shoulder Pain And Disability Index

ROM: Range Of Motion

1. Introduction

Adhesive capsulitis which is characterized by gradual onset of shoulder pain with progressive limitation of both active and passive shoulder range of motion.⁽¹⁾ Its Prevalence rate being 2% in common population affecting people above 40 years of age and 70% of Adhesive capsulitis occurs in women. 20-30% of patients develop this condition bilaterally.⁽²⁾ This study is done with Patients in stage II having Severe pain during shoulder movements for 3-9 months with Marked limitation of shoulder flexion, extension, abduction, internal rotation.⁽³⁾

Significant role of scapula in producing smooth, coordinated movement maintains the stability of the glenohumeral joint hence producing more stable base for smooth movement.⁽¹¹⁾

2. Need for the Study

- According to the study conducted by Umit Binyol, Capsular stretching cause significant reduction in pain and improvement in function of shoulder in patients with adhesive capsulitis.⁽⁶⁾
- According to the study conducted by Anuj hiralal gulwani et al. ((2020), it is concluded that scapular stabilization exercises have to be included in the rehabilitation protocol of adhesive capsulitis.⁽⁷⁾
- There arises the need to find the effectiveness of these combined exercise regimen in improving ROM of adhesive capsulitis.

3. Materials and Methodology

Statement of the Study: Effect of capsular stretch and scapular exercises on pain and disability among stage II Adhesive Capsulitis stabilization.

Sample Size: 15 participants.

Sample Technique: Convenient sampling technique.

Study Design: Experimental study of pre-test post test type.

Study Population: Subjects diagnosed with stage II adhesive capsulitis.

Measurement Tool: Shoulder Pain And Disability Index (SPADI)⁽¹²⁾

Inclusion Criteria:

- age of 40-50 years.
- Males , Females
- Subjects with 2nd stage of Adhesive Capsulitis. (Duration of symptoms 3-9 months. Chronic pain with active and passive range of motion with Significant limitation of forward flexion, abduction, internal rotation and external rotation)⁽³⁾
- Patients not under medications for shoulder pain.
- Patients with or without diabetes.

Exclusion Criteria:

- Rupture of Rotator cuff
- Secondary adhesive capsulitis
- Painful stiff shoulder after serious injury
- Fracture of shoulder complex
- Inflammatory diseases as Rheumatoid Arthritis.

- calcification of Tendon

Duration of Study: Two weeks.

Statistical Tool: Paired t-test is used in the study.

4. Procedure

Capsular stretch:

- ✓ Patients received Capsular stretching for the anterior, posterior, inferior capsules of the shoulder.

- ✓ Anterior capsular stretch

side lying position chosen with affected arm facing upwards shoulder and arm will be brought backwards to extension passively maintaining 30 seconds.

- ✓ Posterior capsular stretch

supine lying position chosen Therapist manually performs crossbody adduction maintaining for 30 seconds.

- ✓ Inferior capsular stretch

supine lying position chosen with hand behind their head maintaining the shoulder in abducted position for 30 seconds.

Scapular Stabilization Exercise:

- SCAPULAR CLOCK EXERCISE:

Scapular clock exercises consists of maintaining the arm at 3 positions against the wall

- Maintaining the arm at 3'o clock position. This position facilitates protraction of scapula.
- Maintaining the arm at 6'o position. This facilitates depression of scapula.
- Maintaining the arm at 9'o position. This facilitates retraction of scapula.

- BALL STABILIZATION EXERCISE:

Patient is instructed to stand near the wall facing it. Patient holds the therapy ball against the wall in the hand. The subject must hold the ball continuously in spite of perturbations being applied in different directions.

- TOWEL SLIDE:

In this patient sits in a chair with forearm in mid prone position and resting on the table. The patient slides the towel up, down and sideways.

- SHOULDER BLADE SQUEEZE:

- The patient is asked to squeeze the shoulder blades together. Hold it for 15 seconds and repeat for 10 times.

- SCAPULAR ISOMETRICS Patient is asked to lean over the table with the forearms on table and asked to gently lean over the shoulder.

- WALL PUSHUPS:

The patient stands in front of the wall. In a feet away from the wall and keeping the body straight, tightening the core and buttock, patient bends the elbows, bringing the chest towards the wall.⁽⁷⁾

For 6 days in a week for 14 days each is given for 10 repetitions, hence 45 minutes per session.

Study Setting : Pathmavathy clinic, Perambur, Chennai.

Tools Used : SPADI was used to measure decrease in pain and disability.

Outcome Measures : Pain and Disability.

Experimental Group:

S. NO	PAIN		DISABILITY	
	PRE	POST	PRE	POST
1	76	62	71	62
2	70	52	73	63
3	80	68	76	67
4	60	46	58	46
5	68	53	75	62
6	56	43	55	40
7	59	45	56	41
8	67	53	70	57
9	72	60	69	53
10	78	66	72	60
11	51	36	48	33
12	62	50	58	43
13	58	44	55	41
14	42	27	39	25
15	79	64	74	58

Comparing Pre and Post Test Values of Experimental Group

Changes within Experimental Group is analyzed using paired t test

S.NO	VARIABLE	DAYS	MEAN		t VALUE	LEVEL OF SIGNIFICANCE
			PRE	POST		
1	Pain	Day 1 &28	65.2	51.3	33.2	$P < 0.05$
2	Disability	Day 1 &28	63.3	50.1	21.6	$P < 0.05$

Comparison of Pre Test Values (Experimental Group)

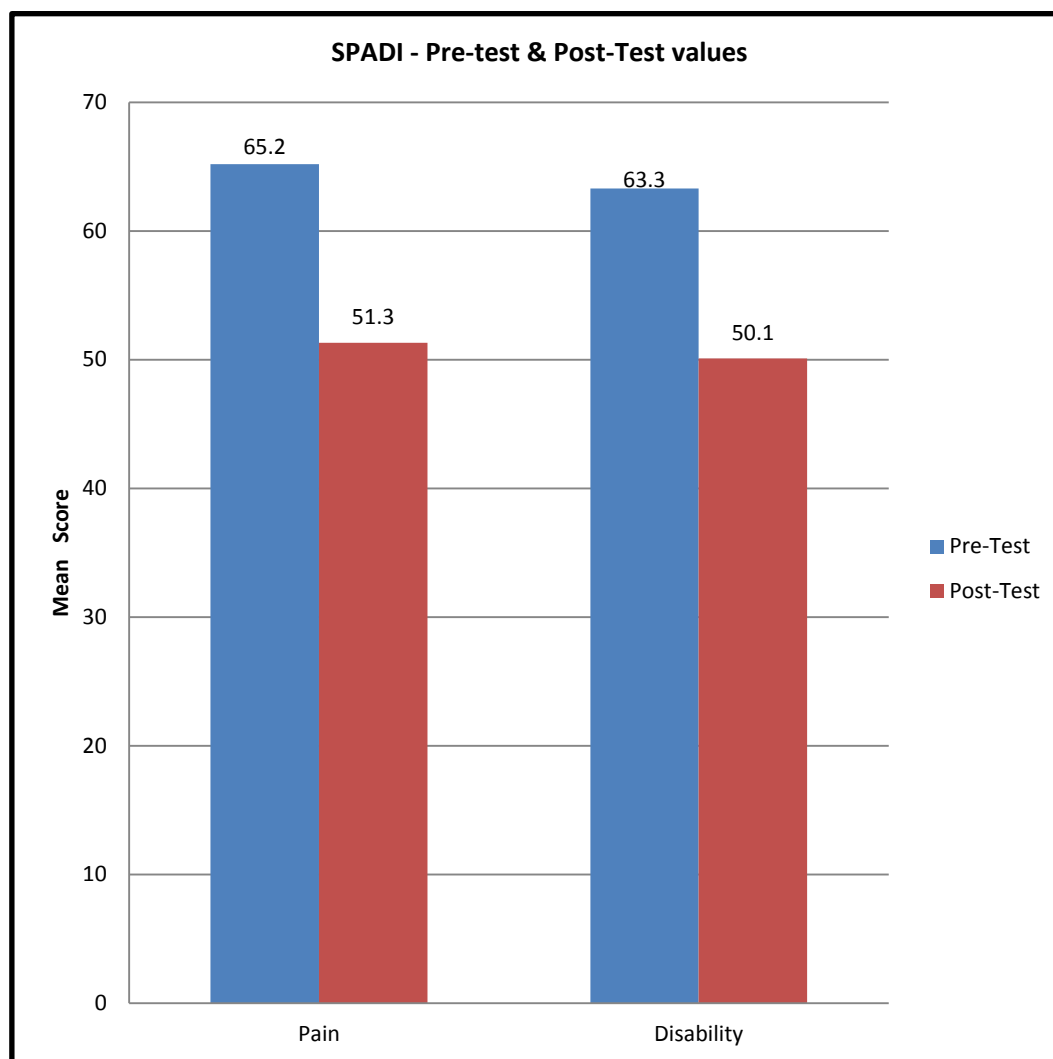
The descriptive statistics mean, standard deviation, t-value has been obtained using t-test. The statistical results support the application of Capsular stretch and scapular stabilization exercises are effective.

GROUP	EXPERIMENTAL (mean)	t VALUE	LEVEL OF SIGNIFICANCE
SPADI	65.2	33.2	$P < 0.05$
	63.3		

Comparison of Post Test Values in Spadi in Experimental Group

The descriptive statistics of post test values of SPADI Experimental Group in this t-test value is 21.6 SPADI <0.05 with the mean value is 50.1

GROUP	EXPERIMENTAL (mean)	t VALUE	LEVEL OF SIGNIFICANCE
SPADI	51.3	21.6	$P < 0.05$
	50.1		



Graph 1: Comparison of pre-test & post-test values

Experimental Group➤ **Pain**

- Mean value of pre test is 65.2 and post test is 51.3
- For 14 degrees of freedom and at 5% level of significance, the table value is 1.761
- t value is 33.2 is found to be greater than the table value 1.761 On Acceptance of alternate hypothesis, there is reduction in pain in **DISABILITY**
- Mean value of pretest is 63.3 and post test is 50.1

- For 14 degrees of freedom and at 5% level of significance, table value is 1.761
- Calculated value t is 21.6 which is greater than the table value 1.761
- Since alternate hypothesis is accepted there is improvement in disability

5. Discussion

Adhesive capsulitis is a clinical condition which causes painful stiffness of shoulder joint that persists for a longer period of time. This stiffness of glenohumeral joint leads to increased pain and finally leading to shoulder disability.

There are several possible studies that could explain why Capsular stretch and Scapular Stabilization exercises reduced shoulder pain and disability among people with Stage II Adhesive capsulitis. **Himanshi Sharma (2020)** concluded that muscle energy technique & capsular stretch are effective means of treating subjects with Adhesive capsulitis. **M.A.Harrast (2004)** have concluded that the regular follow up of exercise regimen comprising of active and passive stretching while maintaining normal shoulder Range of motion.

Capsular stretch is effective because of the following reasons:

- It helps to reduce intra articular pressure
- It facilitates separation of the articular surfaces
- It relieves muscle tension thereby reducing pain and disability.

Yatheendra kumar G (2015) concluded that the effectiveness exists in reduction of shoulder pain, increasing glenohumeral ROM, functional ability by restoring the Glenohumeral and scapulohumeral rhythm by usage of scapular stabilisation exercise . Anuj Hiralal Gulwani concluded effectiveness exists to improve shoulder ROM and functional ability in diabetic subjects with stage II Adhesive Capsulitis with conventional & scapular stabilisation exercises.

Scapular stabilization exercises are effective because of the following reasons:

- It provides strength and joint stability to the shoulder joint thereby reducing shoulder disability.
- Scapular stabilization also helps in assisting external rotation & abduction of shoulder joint that is mainly affected in Adhesive capsulitis.
- It helps to regain the normal shoulder control over the shoulder movement.

6. Conclusion

Overhead activity of shoulder joint could lead to repeated stress placed on the shoulder joint. This study shows evidence in reducing pain and disability occurring during the stage II Adhesive capsulitis. This study uses Capsular stretch and Scapular Stabilization exercises in reducing pain and disability among Stage II Adhesive capsulitis. From this study it has been concluded that Capsular stretch and Scapular Stabilization exercises are one of the effective combination of intervention in treating people with Stage II Adhesive capsulitis.

7. Limitations and Recommendations

- 15 samples were used. Hence Larger samples can be analyzed with more number of samples in the Experimental Group
- Age Group selected were between 40-50. Age Group below 40 and above 50 can be selected

- Duration of this study is 2 weeks. Duration can be longer than 2 weeks.
- Only two interventions of training are given. Other methods of intervention like Muscle Energy Technique, Maitland mobilization for shoulder can be given.
- No longer follow up of subjects. Larger follow ups can be done.
- To analyze the effectiveness of reduction in pain, SPADI scale was used. Pain can also be analysed done with Numeric Pain Rating Scale (NPRS).
- To analyze the effectiveness of reduction in disability, SPADI scale was used. Analysis of Disability can also be done with Oxford Shoulder Scale (OSS) or Shoulder Rating Scale (SRS).

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Competing Interest: Nil.

References

- [1] JF de Beer, F Lam (2008) Accessory features of frozen shoulder. SA orthopedic journal spring; 24-29.
- [2] Goyal, M, Bhattecharjee (2013) Combined effect of end range of motion and mobilisation with movement techniques on range of motion and disability in Frozen shoulder patients- A Randomized clinical trial. Journal of exercise science and physiotherapy; 9(2): 74-82.
- [3] Hannafin et al. (2000) Assistance of arthroscopic study; vol 9 issue 12; 89
- [4] Himanshi Sharma et al. Effectiveness of muscle energy technique versus capsular stretching among patients with adhesive capsulitis Vol-7, Issue 7, 325-328.
- [5] Roach KE, Budiman-Mak E, Songsiridej N, Lertratanakul Y. 1991 Development of a shoulder pain and disability index. Arthritis Care Res. Dec;4(4):143-9.
- [6] Umit Binyol, (2005) photomedicine and laser surgery; low power LASER treatment for shoulder pain 23(5): 459-464
- [7] Anuj hiralal gulwani (2020) A study to find out the effect of scapular stabilization exercises on shoulder range of motion and functional outcome in diabetic patients with stage 2 adhesive capsulitis of the shoulder joint- An Interventional Study Vol-5, Issue-2, 320-324.
- [8] Agnihotri DS (2016), Effect of muscle energy technique on range of motion in cases of patients with adhesive capsulitis Int J Health sci Res 6(9): 252-256.
- [9] Shahhaz wawaz ansari (2018), Effect of ultrasound therapy with end range mobilization over cryotherapy with capsular stretching on pain in frozen shoulder. A comparative study Int journal of current research and review, vol (4) issue 24, 213.
- [10] Muhammed kashif (2019) Effect of posterior capsule stretch on adhesive capsulitis.
- [11] Brain C Thomas, (2000) the role of the scapula in the rehabilitation of shoulder injuries journal of athletic training 30(3): 364-372.
- [12] John D Breckenridge, Journal of physiotherapy (2011), validity and reliability of SPADI Scale vol.57, Issue-3, 197.