

# A Study to Compare the Effectiveness of Scapular Mobilization v/s Shoulder Mobilization in Patients with Frozen Shoulder

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## ABSTRACT

**Background:** Frozen shoulder is a painful condition in which movement of the shoulder becomes severely restricted. The condition can vary in severity from mild to severe pain and/or from some to severe restriction in movement.

**Aims & Objectives:** This study aimed to compare the scapular mobilization along with conventional physiotherapy versus shoulder mobilization along with conventional physiotherapy in patient with frozen.

**Methodology:** This study designed to double blinded randomized control trial and pre-post assessment study. This study included 30 patients diagnosed with stage 3 frozen shoulders. Divided into two groups, Group A Experimental Study (n=15) received scapular mobilization & conventional treatment and Group B Control group (n=15) received Conventional physiotherapy treatment. Before and after commencing the exercise programmed VAS, Goniometry and SPADI was taken as an outcome measure and the data was analyzed by applying non parametric test.

**Result:** As the data was not normally distributed non parametric test was used to compare within and between groups. Statistical analysis showed that by applying Wilcoxon test there was significant improvement noted on SPADI ( $p < 0.03$ ), VAS ( $p < 0.001$ ), and Goniometry ( $p < 0.003$ ) in group A, also the result shows statically significance on VAS ( $p < 0.05$ ), SAPDI ( $p < 0.05$ ), and goniometry ( $p < 0.04$ ), in Group B. while comparing both the groups by Man Whitney U test there was no significant improvement ( $P > 0.09$ ).

**Conclusion:** This study concluded that both scapular mobilization and shoulder mobilization was effective to relieve pain, improve shoulder range of motion and quality of life of patient but scapular mobilization was found to be more effective compared to shoulder mobilization.

**Key words:** Frozen shoulder, scapular mobilization, shoulder mobilization, SPADI, VAS, goniometry.

## INTRODUCTION

The most mobile joint in the human body is shoulder joint referred to as the shoulder complex includes glenohumeral, sternoclavicular, acromioclavicular joint and scapula thoracic articulations.<sup>1</sup> Codman in 1934 introduced the term "frozen shoulder". He described frozen shoulder as a painful condition of insidious onset that was associated with stiffness and difficulty in

sleeping on the affected side.<sup>2</sup> Frozen Shoulder defined as a common condition characterized by insidious and gradual inflammation of the glenohumeral joint capsule leading to its contracture and thus resulting in stiffness and loss of shoulder mobility. 2–5.3% is the prevalence rate reported, age group between 40 to 70 years commonly affected. Pre-existing shoulder condition such as dislocation, humeral

fracture, and osteoarthritis or a neurological condition leading to muscular imbalances occurs during secondary adhesive capsulitis. The prevalence of secondary adhesive capsulitis related to type 2 diabetes and thyroid disease is between 4.3% and 38%.<sup>3</sup>

Shoulder pain as well as loss of active and passive range of motion (ROM) are the main symptoms of a Frozen Shoulder (FS). Most FS patients feel pain especially when doing shoulder abduction, internal rotation, and external rotation. Treatment of frozen shoulder includes manual techniques such as joint distraction, compression, and gliding, combined with various frequency and amplitude.<sup>4</sup> Scapular-mobility exercises, or scapular-mobilization (SM) techniques is widely used in the treatment of shoulder dysfunction and in the management of musculoskeletal disorders of the shoulder. It involves the manual application of a sustained mobilization (in 4 directions) by a therapist to the scapulothoracic joint.<sup>5</sup>

The Shoulder Pain and Disability Index (SPADI) was used as an outcome measure in this study. SPADI was used in outpatient setting to measure current shoulder pain and disability. It contains 13 items that assess two domains; a 5-item subscale that measures pain and an 8-item subscale that measures disability.<sup>6</sup>

The aim of the study is to compare the effect effectiveness of scapular mobilization VS Shoulder mobilization in patients with Frozen Shoulder.

## MATERIALS AND METHODOLOGY

An experimental study was conducted on 30 patients, n=15(Group A) and n=15 (Group B) who meet an inclusion criteria: age 40 to 60 years including both male and female, patients having diabetes, unilateral frozen shoulder, pain stiffness and limited passive range of motion of lateral rotation, abduction and internal rotation of shoulder joint with complain more than 3 months compared to unaffected side. Patients with

neurological disorders, severe trauma related to painful shoulder, pervious surgery, osteoporosis.

Materials used in this study was goniometry, pen, pencil, and watch. Informed consent was taking and nature of the study was explained to all the subjects. Subjects was divided randomly into two groups. Group A Experimental study (n=15) received scapular mobilization (Maitland grade III and IV) & conventional treatment in the form of Ultrasound dosage continuous 3MHZ frequency and Intensity of 1.5 W/cm<sup>2</sup> for 10 minutes, scapular stabilization exercise, Shoulder girdle exercise, wand exercise, rope and pulley, finger ladder and Ice pack and Group B Control group (n=15) received Conventional physiotherapy treatment include Ultrasound dosage continuous 3MHZ frequency and 1.5 W/cm<sup>2</sup> for 10 minutes, shoulder mobilization, scapular stabilization exercise, Shoulder girdle exercise, rope and pulley and finger ladder and Ice pack. Each treatment session was given 5 days/ week for 45 minutes.

Range of motion (ROM) via goniometry, SPADI and VAS were obtained at the beginning, on week 2, and on week.6. Pre and post data was analyzed on day 1, week 2, and week 6. Analysis was made by applying non parametric test. Within group comparison was done by Wilcoxon test and between groups comparison was done by Man Whitney U test.

## RESULT

An experimental study was conducted on 30 patients, 15 in group A and 15 in group B with the mean age of 40 to 60. As the data was not normally distributed, non parametric test was used to analyze the data. Wilcoxon was used to compare within group and Man- Whitney test U was used to compare between group comparisons.

Table no 1: Demographic detail

|                |                      |
|----------------|----------------------|
| Age            | 40 to 60             |
| Gender         | Both male and female |
| No of patients | 15 in each group     |

**Table no 2: Effect of scapular mobilization in Group A**

| Group | Variable   | Day 1<br>Mean± SD | Week 2<br>Mean± SD | Week 6<br>Mean± SD | P value   | significance |
|-------|------------|-------------------|--------------------|--------------------|-----------|--------------|
|       | VAS        | 6.4±1.12          | 4.8± 1.424         | 2.6± 1.18          | (p<0.001) | Significance |
| A     | SPADI      | 50.6± 3.5         | 44.6±3.6           | 40.5±2.4           | (p<0.04)  | Significance |
|       | Goniometry | 57.1±6.3          | 62.1±6.31          | 69.0±4.9           | (p<0.04)  | Significance |

**Table no 3: Effect of shoulder mobilization in Group B**

| Variables  | P value | significance     |
|------------|---------|------------------|
| VAS        | 0.06    | Not significance |
| SPADI      | 0.09    | Not significance |
| Goniometry | 0.10    | Not significance |

**Table no 4: Comparison between groups**

| Group | Variable   | Day 1<br>Mean± SD | Week 2<br>Mean± SD | Week 6<br>Mean± SD | P value   | significance |
|-------|------------|-------------------|--------------------|--------------------|-----------|--------------|
|       | VAS        | 7.6±1.34          | 6.2± 1.56          | 5.2± 1.20          | (p< 0.05) | Significance |
| A     | SPADI      | 52.7±3.9          | 49.8±3.1           | 43.8±1.1           | (p< 0.04) | Significance |
|       | Goniometry | 53.1±5.73         | 58.1±5.73          | 64.6±5.31          | (p<0.04)  | Significance |

Statically significant improvement noted on Goniometry, SPADI and VAS in both the groups but more significance was noted in Group A. Further while comparing between group there was no statically significances.

## DISCUSSION

The comparative study was conducted to study the effectiveness of Scapular mobilization and shoulder mobilization techniques in the treatment of adhesive capsulitis for 6 weeks in terms of reduction of pain using SPADI pain subscale and improvement in GH range of motion using universal goniometry. Scapular mobilization toward abduction and combined conventional led to increase the ROM approx 10 degree. Whereas shoulder mobilization increase 5 degree ROM, clinically it shows significant after the treatment session.

GH and scapulothoracic joints are recognized in the closed kinetic chain. We assume that GH joint mobilization improves shoulder movement and normalizes the SHR. Scapular mobilization should improve shoulder movements, improving the functional status of the shoulder if scapular and shoulder movements are improved.<sup>8</sup>Joint mobilization techniques also have neurophysiologic effects based on peripheral mechanoreceptor stimulation and nociceptor inhibition, according to Surenkok O et al.,. These mechanoreceptors are mostly present around the synovial

joints. Scapular mobilization can be linked to the muscle structures instead of the synovial joint, which is rich in mechanoreceptors. In the present study, after scapular mobilization, VAS scores improved. We therefore suggest that scapular mobilization can be linked to muscle structures instead of the synovial joint, which is rich in mechanoreceptors.<sup>9</sup> Limitation of the study is small sample size, follow up not taken. Future recommendation capsular stretching VS sleepers stretching in frozen shoulder.

## CONCLUSION

This study concluded that both scapular mobilization and shoulder mobilization was effective to relieve pain, improve shoulder range of motion and quality of life of patient but scapular mobilization was found to be more effective compared to shoulder mobilization.

### Declaration by Authors

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

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