

Research article

Efficacy of posterior-anterior glide along with active lateral rotation for adhesive capsulitis

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Corresponding author: **Kamalakannan M.** Email: kamal1712@gmail.com**ABSTRACT**

Introduction and Aim: A complicated anatomical structure of our body enables movement in several planes and is important for everyday activities. Adhesive capsulitis or frozen shoulder produces pain and reduces the joint range of motion, especially external rotation. This study aimed to find the effectiveness of posteroanterior glide along with active lateral rotation for adhesive capsulitis.

Materials and Methods: Quasi-experimental study with a simple random sampling technique was followed. Thirty subjects with an age group 33 to 55 years, both gender with adhesive capsulitis. Non-cooperative patients, previous history of fracture in and around the shoulder joint, open wound in and around the shoulder joint, subjects with a loss of sensation around the shoulder joint were excluded. Pre and post-test values were measured using a visual analog scale and range of motion as outcome measures. The experimental group was given a posteroanterior glide along with active lateral rotation combined with shortwave diathermy. The conventional group was given conventional therapy along with shortwave diathermy. The frequency of the treatment was 5 days per week for 2 consecutive weeks. The values are tabulated and statistically evaluated.

Results: The post-test mean value of VAS in the experimental group was 4.20 and conventional group was 6.07. The post means value of ROM in the experimental group was 64.33 and conventional group was 29.67. Thus, the experimental group had a high statistical difference from the conventional group.

Conclusion: The study concludes that posterior-anterior glide along with active lateral rotation has a good effect on pain, and range of motion in adhesive capsulitis.

Keywords: Adhesive capsulitis; goniometer; joint mobilization; shortwave diathermy.

INTRODUCTION

The shoulder is a complicated anatomical structure that enables movement in several planes and is important for everyday activities. Adhesive capsulitis is primarily an idiopathic disease that occurs more often in patients with diabetes and hypothyroidism (1). Adhesive capsulitis or frozen shoulder is a common shoulder condition marked by pain and a reduction in range of motion, especially in external rotation (2). Adhesive capsulitis, also known as arthrofibrosis, is a disease in which the body produces excessive scar tissue or adhesions around the glenohumeral joint, causing discomfort, stiffness, and dysfunction. Adhesive capsulitis is a chronic disease (3) that may develop spontaneously or because of trauma (secondary adhesive capsulitis).

Adhesive capsulitis affects around 3% to 5% of the general population, but it can affect up to 20% of diabetic patients. Bilateral involvement has been identified up to 40% to 50% of cases are idiopathic, which usually affects the nondominant extremity. The shoulder joint is made up of bone, hyaline cartilage, labrum, ligaments, capsule, tendons, and muscles, which collectively form the shoulder complex. It connects the trunk to the upper limb and plays a key

biomechanical function in everyday activities (4). It has been proven that people with diabetes and hypothyroidism are five times more likely to develop adhesive capsulitis. It indicates that the incidence of adhesive capsulitis is higher when hypothyroidism and diabetes mellitus are both presents.

The shoulder complex is one of the most freely moveable areas in the human body due to its articulation at the glenohumeral joint. Which consists of a shoulder girdle, that connects the upper limb to the axial skeleton via the sternoclavicular joint. The high range of motion of the shoulder comes at the expense of decreased stability of the joint, and it is prone to dislocation and injury (5).

Short-wave diathermy relieves pain and increases the extensibility of tissue. Shortwave diathermy is also effective in deep-rooted pain management and covers a wide area of skin (6). For the acute type of injury Pulsed shortwave diathermy (PSWD) is used for generating thermal effects in superficial tissues (7). The pendulum or Codman exercise, created by Edina Codman, is a passive shoulder exercise that is often recommended during shoulder recovery. It's used to help with joint range of motion without the need for a muscle contraction. The rotator cuff is made up of four muscles that cover the shoulder joint: supraspinatus,

infraspinatus, subscapularis, and teres minor. This exercise uses the arm's weight and momentum to facilitate movement at the shoulder joint while keeping the damaged or healed muscles inactive. The muscles under the shoulder complex produce a wide range of motion, especially the rotator cuff muscles which function to move the shoulder and arm as well as provide structural integrity to the shoulder joint (8). The study aims to find the efficacy of posterior-anterior glide with lateral rotation to improve quality of life.

MATERIALS AND METHODS

Subjects

Diagnosed adhesive capsulitis patients. Study design: Quasi-experimental study. Sampling technique: Simple random sampling technique. Sample size:30. Inclusion criteria: Age group 33 to 55 years, both the gender, adhesive capsulitis. Exclusion criteria: Non-co-operative patients, previous history of fracture in and around the shoulder joint, open wound in and around the shoulder joint, subjects with loss of sensation around the shoulder joint.

Procedure

Patient willing to participate in the study were screened for inclusion and exclusion criteria and explained about the safety and simplicity of the procedure. A total sample size of 30 members was selected and divided equally (n=15) among experimental (group A) and conventional (group B) study respectively. Pretest value such as range of motion and VAS are measured for both the groups before starting the treatment. Experimental group was given posterior- anterior glide for 3 sets every session and each set contain 30 reps along with shortwave diathermy. The treatment was given for 5 days in a week and continued for two consecutive weeks. Patient was lying in supine position and the therapist standing in the affected side performing mobilization technique. After this post-test values for range of motion and VAS for experimental group was noted, tabulated, and will be statistically evaluated. Conventional group was given Codman's pendular exercise along with shortwave diathermy. The treatment was provided for 5 days in a week and continued for two consecutive weeks. After that post test value for range of motion and VAS were measured, noted, tabulated, and statistically evaluated.

RESULTS

Patients willing to participate in the study were screened for inclusion and exclusion criteria. They have explained the safety and simplicity of the procedure. A total sample of 30 was selected. Of those 15 members selected for the experimental group. And 15 members were selected as group B conventional group. Pretest values such as range of

motion and VAS are measured for both groups before starting the treatment. The experimental group was given posteroanterior glide for 3 sets every session and each set contain 30 reps along with shortwave diathermy. The treatment was given 5 days a week and continued for two consecutive weeks. The patient was lying in the supine position and the therapist standing on the affected side performing a mobilization technique. After this post-test values for the range of motion and VAS for the experimental group were noted, tabulated, and will be statistically evaluated. The conventional group was given Codman's pendular exercise along with shortwave diathermy. The treatment was provided 5 days a week and continued for two consecutive weeks. After that post-test values for a range of motion and VAS were measured, noted, tabulated, and statistically evaluated.

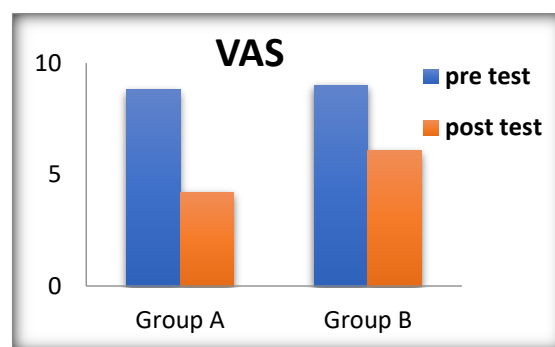


Fig.1: Pre and post values of VAS in groups A and B

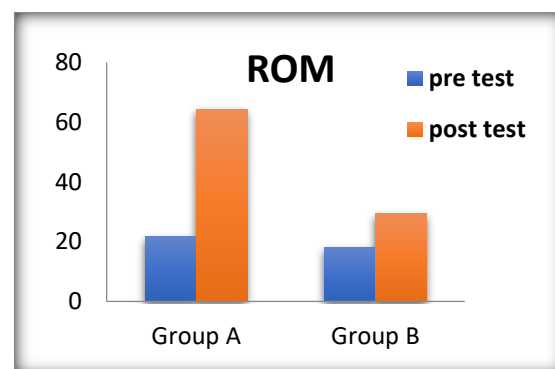


Fig.2: Pre and post values of ROM in group A and B (internal rotation)

DISCUSSION

The purpose of the study is to find the long-term effect of shortwave diathermy and Codman exercise for adhesive capsulitis. This comparison is demonstrated with a duration of weeks. The outcome results were measured by VAS and Goniometry before and after treatment. Beneficial effects were significantly greater in shortwave diathermy than that the Codman exercise. The study was conducted at the outpatient clinic of the Department of Physical Medicine and Rehabilitation, Medical Faculty of Cukurova University, Adana, Turkey. The study

population consisted of 40 patients between 40 and 85 years of age.

According to Draper, heat therapy can increase joint mobilizations because of the activation of collagen extensibility. Which increases joint accessory movements. Because of this effect, it shows a good and effective treatment for this condition (7). According to Kelley, it is stated that joint mobility can be increased by heat modality like shortwave diathermy (SWD). In the study, they used SWD along with joint mobilization which produced a good difference in range of motion (9).

According to Draper, in his study, 4 participants showed (67%) improvement in extension ROM, and (50%) exceeded the norms. Five participants (83%) returned to normal activities and full use of their elbows. One month later, after follow-up 5 participants had maintained the ROM, on average, (mean \pm SD) $92\% \pm 6\%$ of their final measurements (10). According to Long, the supraspinatus EMG signal amplitude was abnormal during pendulums exercise who performed appropriately than during those performed correctly. Both correct and incorrect large pendulums resulted in statistically greater muscle activity in the supraspinatus than small pendulums (11).

According to Mullaney, the reported long-term effect of adhesive capsulitis found that initially the dominant arm consistently showed a better ROM; however, the nondominant arm had an accelerated recovery at a later stage, ending up with a better range (except for rotation) by 40 to 48 months. (12). According to Balci, asymmetrical capsular tightness has a potential impact on humeral head motion, especially when tension in the capsule increases as the arm is taken further into elevation (13-15).

Cunningham demonstrates that Codman pendulum exercises produce very little movement in the GH joints. Although they may be a safe way to promote early general stretching of the upper limb, they may be of limited further use in restoring passive shoulder ROM (16-17).

According to Orsi, Codman's exercise is still actual because of a variable nomenclature, an inconsistent reporting of disease staging, and many types of treatment. In a multigroup clinical trial study, subjects with less muscle flexibility and capsular tightness are randomly placed in intervention groups that receive either soft tissue mobilization and muscle-stretching procedures or posterior glide stretch mobilizations would verify whether it is beneficial for interventions to be selected to address the primary reason of the external rotation ROM restriction found during the physical examination (18-20). According to Park, no significant differences were found in pain verbal rating scores after 1 year.

(21). As per Ulusoy, supervised physiotherapy with NSAIDs improves the ROM values in most patients with adhesive capsulitis. A small percentage of patients may require operative treatment (22). According to Jason, a sufficient level of evidence for manual treatment must be combined with commonly indicated exercise or conventional physiotherapy, as it remains the standard care (21).

According to Boutefnouchet, capsular tightness has a high success rate regardless of the underlying etiology. However, diabetic subjects have residual pain, reduced motion, and inferior function compared to idiopathic cases. The rate of revision capsular release is higher in patients with post-surgical adhesive capsulitis when compared to idiopathic cases (22). As per Kaddah, end-range mobilization and scapular mobilization was highly significant and more effective than passive stretching exercises in reducing shoulder pain severity, quality of life, and range of motion of shoulder flexion and abduction (24).

CONCLUSION

From this result, it has been concluded that posterior-anterior glide along with active lateral rotation along with shortwave diathermy of the experimental group was found more effective than conventional therapy of the conventional group, in reducing pain and increasing range of motion and thereby leading to faster recovery in subjects with adhesive capsulitis.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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