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**EFFECT OF SCAPULAR DYSKINESIS EXERCISE IN PATIENT WITH PERI
ARTHRTIS SHOULDER**

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ABSTRACT

The aim of the study was to find out the effect of scapular dyskinesis exercise in patient with periarthritis shoulder. The thirty subjects with periarthritis shoulder patients were selected based on the inclusion and exclusion criteria. The subjects were divided into two groups Group-A and Group- B each group consist fifteen subjects in each. Group-A subjects received UST, standardized shoulder exercises. Group-B subjects received UST, scapular dyskinesis exercises. Numeric pain rating scale (NPRS) and Lateral scapular slide test (LSST) should be used. All the values were tabulated and statistically analyzed by using paired and unpaired t-test. Paired t-test is used to compare data set within the groups and unpaired t-test is used to compare the data set between the groups. Student t test analysis revealed significant difference ($p < 0.0001$) between the two groups A and group B. Scapular dyskinesis exercises and ultrasound therapy was given in this study was found to be effective in improving shoulder range of motion and correction of scapular alteration.

Keywords: Periarthritis Shoulder, Scapular Dyskinesis Exercise, Lateral Scapular Slide Test, Numerical Pain Rating Scale

INTRODUCTION

The shoulder is a very complex joint that is crucial to many activities of daily living. Shoulder complaints are a common problem in the general population. Incidence figures 0.9% to 2.5% have been reported for different age group and 3% of general

population is affected by idiopathic loss of shoulder range of motion. A global decrease in shoulder range of motion is called periarthritis shoulder [1].

Periarthritis shoulder is characterized by an insidious and progressive loss of active and

passive mobility in the glenohumeral joint presumably due to capsular contracture [2]. In periarthritis shoulder condition can occur alteration in the function of the scapula tilts anteriorly and laterally its occurs, weakness of the scapulothoracic muscles potentially leads to abnormal positioning of the scapula, disturbances in scapulohumeral rhythm, and generalized shoulder dysfunction [3].

The role of the scapula in upper extremity function has received considerable interest in recent years as our knowledge of the shoulder and surrounding structures has increased. The scapula plays several roles in facilitating optimal shoulder function when scapular anatomy and biomechanics interact to produce efficient movement. In normal upper-quarter function, the scapula provides a stable base from which glenohumeral mobility occurs. Stability at the scapulothoracic joint depends on the surrounding musculature. The scapular muscles must dynamically position the glenoid so that efficient glenohumeral movement can occur. When weakness or dysfunction is present in the scapular musculature, normal scapular positioning and mechanics may become altered [4].

The scapula performs three major roles in the production of smooth, coordinated movement about the shoulder girdle. The first role of the scapula is the maintenance

of dynamic stability with controlled mobility at the glenohumeral joint [5]. The second role the scapula plays is as a base for muscle attachment. The muscles that stabilize the scapula attach to the medial border of the scapula, thereby controlling its position. This musculature controls scapular motion mainly through synergistic cocontractions and force couples, which are paired muscles that control the movement or position of a joint or a body part. The main functions of these force couples are to obtain maximal congruency between the glenoidfossa and the humeral head, to provide dynamic glenohumeral stability, and to maintain optimal length-tension relationships. The third role of the scapula is best represented as the link in the proximal-to-distal transfer of energy that allows for the most appropriate shoulder positioning for optimal function.

The most common weak or inhibited muscles are the lower stabilizers of the scapula (serratus anterior, rhomboids, middle and lower trapezius). The serratus anterior and lower trapezius form an important force couple that produces acromial elevation. If part of that force couple is absent the scapular movement is altered [6].

Scapular dyskinesis is defined as observable alterations in the position of the scapula and the patterns of scapular motion in relation to

thoracic cage. This is caused by bony posture or injury, contractures and other flexibility problems, Alteration in muscle function.

This scapular dyskinesis exercises are scapular clock exercise, PNF D2 pattern, towel sliding, serratus anterior puncher this set of exercises that strengthen the shoulder girdle muscles to restore normal scapular motion and correct dyskinesia. These exercises also aim to facilitate energy transfer through the kinetic chain. An essential part of rehabilitating the kinetic chain therefore involves exercises that transfer energy from the trunk to the arm [7].

Kibler, 1991, [8], has developed the less time-consuming lateral scapular slide test to evaluate scapular stability. This test compares the distance between a fixed point on the vertebral column and the scapula on the affected side (in specific positions) with that of the unaffected side as varying amounts of loads are placed on the supporting musculature.

MATERIALS AND METHODS

The study was conducted in a teaching hospital and was cleared by institutional ethical committee. Thirty subjects with peri-arthritis shoulder attending outpatient department were selected conveniently and randomly assigned into two groups. Subjects in the age group of 35 to 55 years,

Male and female subjects are diagnosed with peri- arthritis shoulder ,Shoulder Capsular pattern positive and normal findings on radiographs within one year were included. Any type of fracture in relation to the shoulder or shoulder girdle within year, A history of rotator cuff or glenoidlabral tear, shoulder dislocation, or shoulder surgery within the past year, history of direct contact injury to the neck or upper extremities within the past 30 days and Shoulder girdle motor control deficits associated with neurological disorders (e.g. stroke, or Parkinson's disease) were excluded. There are two outcome measures should be used numeric pain rating scale and Lateral scapular slide test.

Group A– Control group received ultra sound therapy (UST) and standardized shoulder exercises treatment. Each exercise was implemented for 3 sets -10 repetitions - 5days for 3 weeks Ultrasound Therapy The patients in sitting position and placed on shoulder joint. Parameters with the duration of ten minutes, Intensity of 1 W/ Cm² and the Frequency –1MHZ in continuous mode. **Group B**– experimental group received ultrasound therapy and scapular dyskinesis exercise.

Scapular dyskinesis exercise consists of Scapular-clock exercise, PNF D²Pattern, Towel Sliding, and Serratus Anterior Punches. In the scapular-clock exercise, the

patient envisions a clock tattooed on the injured shoulder. The patient places the hand of the injured arm on a ball on a plinth. The patient then moves the shoulder in the direction of the 12 o'clock, 3 o'clock, 6 o'clock, and 9 o'clock positions, which facilitates elevation, retraction, depression, and protraction of the scapula, respectively. PNF D2 pattern (shoulder flexion, abduction, and external rotation) can be used to mimic functional directionality and facilitate triplanar conditioning, with either manual resistance or surgical tubing. They recommended performing this exercise to the point of fatigue or until the athlete loses the ability to maintain the shoulder in a 90 degree abducted position.

In the towel slide, the patient stands near a plinth with the hand of the injured arm on a towel on the plinth at the side. Instruct the patient to forward flex at the hips (while keeping the thoracic spine in relative extension) such that shoulder flexion is induced, producing a light stretch. Then instruct the patient to straighten up and extend the shoulder. When the shoulder is

fully extended, instruct him or her to concentrate on "pinching" the scapulae together to facilitate the rhomboids and lower trapezius muscle. Alternating serratus anterior punches with a tubing system strengthens the often-neglected serratus anterior muscle, as well as the rotator cuff muscles. This exercise can also be used for increasing range of motion and strengthening throughout the course of treatment. Begin static-stance punching with light dumbbells and progress to stepping alternating punches with a tubing system or Thera-Band.

All the above exercise was implemented for 3 sets -10 repetitions -5days a week for 3weeks duration.

RESULTS

The collected data were tabulated & analyzed using descriptive & inferential statistics. To all parameters mean & standard deviation (SD) were used. Paired t-test was used to analyze significant changes between pre-test & post-test measurements. Unpaired t test was used to analyze significant changes between two groups.

Table 1: Within Group Analysis of Pre-Test and Post-Test Measurement of Group A

Group A		Mean (cms)	Standard deviation (cms)	t value	p value
Lateral scapular slide test (cms)	Pre test	1.960	0.256	6.3350	<0.0001
	Post test	1.587	0.210		
Numeric pain rating scale(cms)	Pre test	6.40	0.99	9.9064	<0.0001
	Post test	3.87	0.74		

Table 2: Within Group Analysis of Pre-Test and Post-Test Measurement of Group B

Group B		Mean (cms)	Standard deviation (cms)	t value	p value
Lateral scapular slide test (cms)	Pre test	1.980	0.317	10.4731	<0.0001
	Post test	1.120	0.101		
Numeric pain rating scale (cms)	Pre test	6.20	0.94	15.6380	<0.0001
	Post test	2.40	0.51		

Table 3: Post Test Measurements of Control and Experimental Group

Parameter	Post Test Values				't' test	Significance
	Group A		Group B			
	Mean (cms)	Standard Deviation (cms)	Mean (cms)	Standard Deviation (cms)		
Lateral scapular slide test in (cms)	1.640	0.277	1.120	0.101	7.7505	<0.0001
Numeric pain rating scale in (cms)	3.87	0.74	2.40	0.51	6.3134	<0.0001

DISCUSSION

The purpose of the study was to evaluate the influence of scapular dyskinesis exercise to correct the scapular alteration and to improve the shoulder range of motion in peri-arthritis shoulder patient.

The result showed that this procedure was able to produce a mean increase of 1.640 cm in lateral scapular slide test and numerical pain rating scale as 3.87 cm to control group. In experimental group a mean decrease of 1.120 cm in lateral scapular slide test and numerical pain rating scale as 2.40 cm. Results from this trial will add evidence to the limited body of knowledge about the effect of scapular dyskinesis exercise in patient with peri-arthritis shoulder patient.

Peri-arthritis shoulder condition can occur alteration in the function of the scapula tilts anteriorly and laterally its occurs, weakness of the scapulothoracic muscles potentially leads to abnormal positioning of the

scapula, disturbances in scapula humeral rhythm, and generalized shoulder dysfunction.

To increased prevalence in symptomatic subjects was partially supported through kinematic analysis that showed that symptomatic subjects (54%) had more multiple-plane asymmetries during forward flexion than asymptomatic subjects.

Scapular alterations occur in the presence of shoulder pathology. There is ample literature that suggests that scapular alterations or asymmetries are associated with glenohumeral instability, acromioclavicular separation, and impingement syndrome. These studies report various scapular alterations. Studies evaluating impingement have documented increases in scapular anterior tilt and no increase in scapular anterior tilt. One investigation identified increased scapular posterior tilt in patients with posterior impingement. These

results support that a single scapular pattern is not associated with a specific diagnosis.

This scapular dyskinesia exercises are scapular clock exercise, PNF D2 pattern, towel sliding, and serratus anterior puncher. This clock exercise to facilitates the elevation, retraction, depression, and protraction of the scapula, serratus anterior punches to do use theraband, this exercise to improving and strengthening and regain force couple movement. So this set of exercises that strengthen the shoulder girdle muscles to restore normal scapular motion and correct scapular dyskinesia.

The shoulder covering of fibrous connective tissue called as capsule, the head of the humerus and the shoulder socket are enclosed by the capsule. Normally the capsule is large and loose when periarthritis shoulder condition damage the capsule. So shoulder does not move smoothly in the socket so restriction present

Ultrasound is proposed to promote healing and regeneration in inflamed tissue, to reduce pain and to improve range of motion, the ultrasound parameters used in this study was standardized treatment protocol which are supported by earlier studies. [8] Concluded that effective for periarthritis shoulder condition. Result from this trial will add evidence to the limited body of knowledge about the effect of scapular

dyskinesia exercise in patient with periarthritis shoulder.

All the exercises can and should be varied in many ways, clinicians should challenge themselves to be creative and experiment with different forms of every exercise in order to achieve each individual patient rehabilitative goal. The study showed that statistically significant in ultrasound therapy and scapular dyskinesia exercise is effective than ultrasound therapy and standardized shoulder exercise.

Before the subjects had difficulty in doing exercises, later on with the continuity the exercises become easier and they show better results so interest in performing the exercises thus in turn result in reduces shoulder pain and correction of scapular alteration.

CONCLUSION

The present study among the patients in scapular dyskinesia with periarthritis shoulder on comparing the both the groups, scapular dyskinesia exercises and ultrasound therapy is more effective than the ultrasound therapy alone in the management of patients with scapular dyskinesia in increasing range of motion reducing pain there by functional activities of the patients has been improved.

An effective exercise regime for rehabilitation should include improving the

strength and function of the muscles that control the position of the scapula.

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