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RESEARCH ARTICLE

Effect Of Scapular Stabilization Exercises Versus Traditional Rehabilitation on Periarthritis Shoulder With Scapular Dyskinesis

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Abstract: The term frozen shoulder, commonly known as adhesive capsulitis, refers to a condition characterized by shoulder pain, stiffness, and restricted range of motion. Scapular dyskinesis (SD) denotes abnormal mobility or movement of the scapula, which can further impair shoulder mechanics. This study aimed to analyze the effects of scapular stabilization exercises compared to traditional rehabilitation in patients with periarthritis shoulder associated with scapular dyskinesis. Forty participants from Chennai were randomly divided into two groups: Group A received scapular stabilization exercises, while Group B underwent traditional rehabilitation. Both groups performed exercises three times per week for six weeks. Statistically significant improvements were observed across all outcome measures—Numerical Rating Scale (NRS), Constant-Murley Score (CMS), Pectoralis Minor Index (PMI), and Range of Motion (ROM)—with a p-value less than 0.005.The findings suggest that scapular stabilization exercises are more effective than traditional rehabilitation in improving shoulder function and reducing pain among patients with periarthritis shoulder and scapular dyskinesis.

Keywords: Scapular dyskinesis, Periarthritis shoulder, Scapular stabilization exercise, Range of motion, Shoulder pain.

INTRODUCTION

The shoulder joint has the most movement of any joint in the body, which makes it very prone to inflammatory and degenerative diseases that can cause discomfort and make it hard to move (Lewis, 2015). Frozen shoulder, or adhesive capsulitis, is a common condition characterized by a gradual restriction of active and passive shoulder movements in at least two planes, accompanied by pain and stiffness (Zuckerman & Rokito, 2011). It often affects women between 40 and 70 years of age and is associated with systemic conditions such as diabetes mellitus, hypothyroidism, and Parkinson's disease (Brue et al., 2007). Usually lasting from months to years, the illness goes through three overlapping stages: painful, frozen, and melting (Manske & Prohaska, 2008).

Scapular dyskinesis (SD), defined as the alteration of scapular motion or positioning relative to the thorax, is frequently observed in individuals with shoulder dysfunction (Kibler et al., 2013). Abnormal scapular kinematics can result in diminished glenohumeral stability, modified muscle activation, and disrupted shoulder rhythm, leading to pain and limited mobility (Ludewig & Reynolds, 2009). Tightness in the pectoralis minor and weakness of the serratus anterior are common contributors to altered scapular mechanics (Borstad & Ludewig, 2005).

Traditional therapy for periarthritis shoulder mainly concentrates on restoring mobility via stretching and pendulum exercises. But adding scapular stabilization exercises can help with neuromuscular control, dynamic stability, and shoulder function as a whole (Cools et al., 2014). This study seeks to examine the efficacy of scapular stabilization exercises against typical therapy in enhancing pain, range of motion, and functional results in persons with periarthritis shoulder linked to scapular dyskinesis.

MATERIAL AND METHODS

Study Design and Setting

This randomized controlled experimental study employed a random sampling method to recruit participants. The study was performed at the NBM Rhythm Physiotherapy and Integrated Wellness Centre, located in Chennai. A total number of participants included in the study was 40 which was randomly allocated into Group A (n=20) and Group B (n=20) and the entire duration of the study was six weeks.

Eligibility Criteria

The age group was limited from 40 to 70, both men and women were considered, Patients experiencing shoulder pain and diagnosed with periarthritis and Participants who voluntarily willingly to participate were included in the study. Individuals who suffered a fracture, dislocation, or shoulder surgery, those with scoliosis, cervical spondylosis or neurological disorders were the exclusion criteria. The materials used were goniometer, flexible inch tape, theraband, and dumbbells. Baseline (pre-test) and post-intervention (post-test) assessments were conducted. Group A received scapular stabilization exercises, whereas Group B underwent traditional rehabilitation exercises.

Assessment Tools

The test includes the Constant-Murley Score (CMS), Numerical Rating Scale (NRS), Range of Motion (ROM), Scapular Retraction Test (SRT) and Pectoralis Minor Index (PMI) for shoulder function, for shoulder pain and goniometer was used for the measurment.

Outcome Measures and Statistical Analysis

Assessments for the study were performed and pre and post-test interventions were recorded. Data were analyzed using SPSS version 20, with paired t-tests for within-group and independent t-tests for between-group comparisons. A p-value of less than 0.05 was considered as statistically significant.

RESULTS AND OBSERVATIONS:

Figure 1 shows the gender distribution of participants, with 42.5% being male and 57.5% female. Figure 2 indicates that 35% of the patients had left-sided shoulder involvement, while 65% had right-sided involvement. Table 3 presents the distribution of shoulder dysfunction types, where Type I subacromial dysfunction was the most prevalent (70%), followed by Type II (25%) and Type III (5%).

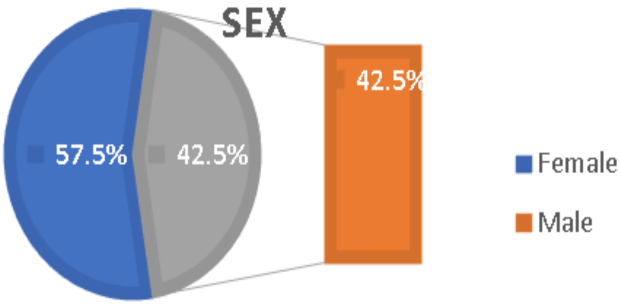

Figure 1: **Frequency and Percentage of Gender distribution**

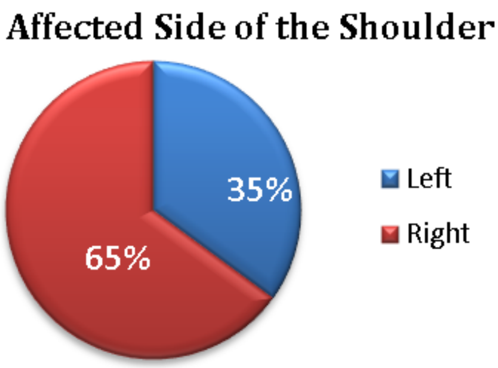

Figure 2: Frequency of affected side of the Shoulder

Table 1: The Distribution of Type of Scapular Dyskinesis

Type of Scapular Dyskinesis	Frequency	Percentage (%)	Cumulative Percent
I	28	70.0	70.0
II	10	25.0	25.0
III	2	5.0	5.0
Total	40	100.0	100

Table 2 illustrates the pre-test and post-test mean values of Group A. The pretest Constant-Murley Score (CMS) was 46.80, which increased to 64.80 post-intervention. The Numeric Rating Scale (NRS) for pain dropped significantly from 6.70 to 3.65. The mean Pain Movement Index (PMI) rose marginally, from 11.72 to 11.93, reflecting better shoulder efficiency during movement. The range of motion (ROM) also became a lot better: passive flexion went from 102° to 141°, passive abduction went from 100° to 126°, active flexion went from 90.50° to 135.50°, and active abduction went fr m 93° to 118.50°. These improvements were statistically significant (p < 0.001).

Tests Performed	Mean	S.D	t	df	p.value
Passive flexion - Group A	141.00	14.105	10.800	38	<0.001
Passive flexion – Group B	104.00	5.982			
Passive abduction - Group A	126.00	13.917	7.790	38	<0.001
Passive abduction- Group B	98.50	7.452			
Active flexion- Group A	130.50	13.169	10.297	38	<0.001
Active flexion- Group B	95.50	7.592			
Active abduction- Group A	118.50	8.751	11.203	38	<0.001
Active abduction- Group B	89.00	7.881			

TESTS	No	NAME	Mean	Std. Deviation	T	df	P valve
Passive flexion	20	Pre-test	102.00	6.959	-13.077	19	<0.001
		Post-test	141.00	14.105			
Passive abduction	20	Pre-test	100.00	9.733	-9.133	19	<0.001
		Post-test	126.00	13.917			
Active flexion	20	Pre-test	90.50	6.863	-19.494	19	<0.001
		Post-test	130.50	13.169			
Active abduction	20	Pre-test	93.00	6.569	-19.494	19	<0.001
		Post-test	118.50	8.751			
PMI Score	20	Pre-test	11.7235	1.27926	-4.941	19	<0.001
		Post-test	11.9305	1.18863			
CMS Score	20	Pre-test	46.80	5.406	-13.150	19	<0.001
		Post-test	64.80	4.420			
NRS Score	20	Pre-test	6.70	0.657	12.990	19	<0.001
		Post-test	3.65	1.040			

Table 2: Statically Analysis of pre -test and post -test values of Group A subject

Table 3 compares posttest mean values between Group A and Group B. Group A showed greater improvements across all outcome measures. The posttest CMS for Group A was 64.80 compared to 48.70 in Group B. The NRS score reduced to 3.65 in Group A and 5.50 in Group B. The PMI mean increased to 11.93 in Group A compared to 11.12 in Group B (p < 0.009). Similarly, posttest ROM values were significantly higher in Group A for both active and passive movements, indicating superior functional recovery (p < 0.001).

Table 3: Statistical analysis of post-test value for Group A and Group B

SRT - Group A	0.55	0.510	-2.626	38	<0.012
SRT- Group B	0.90	0.308			
PMI - Group A	11.9305	1.18863	2.756	38	<0.009
PMI - Group B	11.1165	0.57567			
CMS Score- Group A	64.80	4.420	8.348	38	<0.001
GCMS Score - Group B	48.70	7.406			
NRS Score- Group A	3.65	1.040	-5.343	38	<0.001
NRS Score- Group B	5.50	1.147			

The findings demonstrate that the physiotherapeutic treatment provided to Group A was substantially more effective in extending shoulder range of motion, minimizing discomfort, and boosting total shoulder functionality ($p < 0.001$).

DISCUSSION

This research was conducted to find out the effect of scapular stabilization and traditional rehabilitation on periarthritis shoulder with scapular dyskinesis patients. Forty participants were recruited for the study, and the study was conducted in their respective homes and physiotherapy clinics in Chennai. The ROM of the shoulder joint, the type of SD, the Scapular Retraction test (SRT), and the Pectoralis Minor Index (PMI) were used to assess the position of the scapula to interpret the study. A different classification strategy was proposed by Uhl et al. (2009), which makes utilize of a visual classification framework based on the presence or absence of SD and types of SD (yes/no). The goal of scapular stabilisation exercises is to enhance joint position sense and muscle strength through a combination of strength and stretching. Muscles of the serratus anterior and trapezius work together in the keeping of the scapula safe from any unwarranted movement. Serratus anterior is a key muscle that decides scapular external rotation and reverse tilt, while the lower part of trapezius not only gives off support but also keeps the scapula safe. Depending on the situation, a closed or an open kinetic chain can be used as a base for the exercises of scapular stabilization.

When dealing with SD, the goal of conservative therapy is to regain posterior tilt, external rotation, and scapular retraction. Buttagat et al., (2016) found that by strengthening the muscles supporting the scapula to keep it in its proper position and minimise pain and other symptoms, scapular stabilisation exercises can lessen scapular winging and increase stability. Scapular-clock exercise was the second task that may be utilized for joint kinesthesia to build perceptual knowledge in positioning, posture, and safe mobility. This exercise helped to ease the scapula motions, including elevation, depression, protraction, and retraction.

Reducing the length of symptoms, increasing mobility, lowering pain, and enabling a return to normal activities are the objectives of the study. As this study shows, statistically significant results reveals that patient in group A of scapular stabilization showed a substantial improvement in their range of motion (ROM) and pain compared to group B of traditional rehabilitation. This study forms a supporting platform for the clinicians, researchers, and physiotherapists to assess the scapular dyskinesis for treatment protocol.

CONCLUSION

This study confirms that the finding had a great impact of scapular stabilization exercise Vs. conventional therapy on scapular dyskinesis. There were considerable variations in terms of the mean value yielding greater advantages. It results reveals that scapular stabilization will not only help in increasing the shoulder range of motion but also alleviate the pain earlier when compared to the traditional rehabilitation, thus suggesting that scapular stabilization exercise could add great value in the treatment of scapular dyskinesis.

Conflict of Interest: There is no conflict of interest with the authors.

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