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Comparing the efficacy of movement with mobilization in respect to graded mobilization in adhesive capsulitis of shoulder

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Abstract---Adhesive Capsulitis is a clinical syndrome with painful restriction of both active and passive movements. The condition is aggravated by systemic problems like diabetes mellitus, cardiovascular disease and reflex sympathetic dystrophy. Prolonged activity causes small scapular and biceps muscles to waste faster, load on joint increases and degenerative changes sets in. capsule is fibrosed and shoulder movements are decreased. If the movements are continued, then the fibrosis gradually breaks, movement returns but never come back to normal. Thus, we hypothesize that there will be no significant difference between movement with mobilization and graded mobilization on functional performance in adhesive capsulitis. Total 60 subjects were taken for this study as per inclusion & exclusion criteria. Each group consists of 30 subjects. Treatment in both the groups was given for 15 days continuously. Group A received Movement with mobilization technique whereas Group B received graded mobilizations. The outcome measures used were VAS scale for measuring pain, ROM of the shoulder joint movements using goniometer, power of the muscle assessed through MMT, quality of sleep assessed through Pittsburgh sleep quality Index and Shoulder pain and disability index (SPADI). The result concluded that the

Movement with mobilization technique is more effective than Graded mobilization technique for improving sleep, flexion, extension, abduction and internal rotation ROM and reducing pain and instability among adhesive capsulitis patients. It shows that there is a clinical significant improvement of patient's complaints in both groups.

Keywords---adhesive capsulitis, passive movement, mobilization, range motion, pain.

Introduction

Adhesive Capsulitis is a clinical syndrome with painful restriction of both active and passive movements. The condition is aggravated by systemic problems like diabetes mellitus, cardiovascular disease and reflex sympathetic dystrophy (1). Dupley first described it in 1872 and called it as humeroscapular periarthritis (2). In 1934, Codman coined the term Frozen shoulders, and in 1945, Neviaser gave the name adhesive capsulitis (3). People with diabetes are up to twice as likely to suffer from frozen shoulder. Dr. Richard Bernstein reports this is due to effects on collagen in the shoulder, which holds the bones together in the joint (4). An idiopathic shoulder goes through three stages: the condition becomes progressively worse, plateaus, and then progressively improves, with each stage lasting 3-5 months. During abduction, and repeated overhead activities of the shoulder, long head of biceps and rotator cuff undergo repeated strain (2). This results in inflammation, fibrosis and consequent thickening of the shoulder capsule, which results in loss of movement. If the movements are continued, then the fibrosis gradually breaks, movement returns but never comes back to normal. Prolonged activity causes small scapular and biceps muscles to waste faster, load on joint increases and degenerative changes set in. Capsule is fibrosed and shoulder movements are decreased (4).

Physical therapist uses manual therapy to treat joint dysfunction such as movement with mobilization developed by Brian Mulligan. It is done with the cooperation of therapist and patient i.e.; the physiotherapist performs his part by doing passive glide at peripheral joint on the patient meanwhile the patient performs his part by doing pain free physiological movement (5). The purpose of the mobilization with movement technique is that after its application pain should be reduced. We always when teaching our MWM technique begins with the acronym "PILL." (6) The concept of mobilization with movement which is given by Brian Mulligan's is that it is a natural continuance of the progression in the field of manual therapy which starts from active stretching exercise and later applied by therapist to give passive physiological movement to passive accessory mobilization technique (7). Movement with mobilization is the latest application of a sustained accessory mobilization performed by the therapist and an active physiological movement to end range performed by the patient. No pain is caused while delivering Passive end range over pressure or stretching (8).

The Maitland concept which is defined by International Maitland Teachers Association (IMTA) as a process of examination followed by assessment and then

treatment of neuromuscular disorder through manipulative technique (9). The aim of Maitland mobilization is to improve the range by breaking down the adhesions whereas the aim of Mulligan mobilization is to correct the misalignment and to reduce pain in the treatment of adhesive capsulitis. The application of the Maitland concept can be on the peripheral or spinal joints, require technical explanation and differ in technical term and effect. The concept is named after its pioneer Geoffrey Maitland who was seen as a pioneer of musculoskeletal physiotherapy (10). The grading scale has been separated into two due to their clinical indications: Lower grades (I +II) are used to reduce pain and irritability and the higher grades (III+IV) stretch the capsule of the joint and tissues passively in turn supporting and stabilizing also enhancing the ranges of the joint concerned. The rate of mobilization should be thought of as an oscillation in a rhythmical fashion at: 2Hz- 120 movements per minute for 30 seconds- 1 minute (11).

The need of the study is that currently, physical therapists used for the management of this condition are rest, stretching, strengthening and manual therapy. Movement with mobilization technique versus graded mobilization technique plays an important role in intervention in adhesive capsulitis by improving range of motion and sleep and reducing pain and instability. Both are widely used and test is to select the choice of first line treatment for such cases. Thus, we hypothesize that there will be no significant difference between movement with mobilization and graded mobilization on functional performance in adhesive capsulitis.

Methodology

The study was conducted at the OPD of Physiotherapy department of University Institute of Health Sciences, CSJM University and different hospitals of Kanpur. It was a two group pretest posttest non randomized experimental design. Total 60 subjects were taken for this study as per inclusion & exclusion criteria. They were allocated to 2 groups i.e., group A and group B. Each group consists of 30 subjects. Treatment in both the groups was given for 15 days continuously. Group A received Movement with mobilization technique whereas Group B received graded mobilizations. The inclusion criteria was set as the age group between 30-60 years, both male and female subjects were taken, patients with complain of pain in shoulder, patient with restricted range of motion of shoulder was taken, patients who have been diagnosed with adhesive capsulitis, both diabetic and non-diabetic patients were taken. The exclusion criteria was set as patients who had soft tissue injury around the shoulder, patient with fracture of shoulder complex bones, patients with Malignancy around the shoulder, patients who are on medication for pain relief, elderly patient with weakened connective tissue, patients with any renal, cardiac or any type of disease and those who didn't gave their consent for the study. Simple random and purposive sampling method was used for this study. The outcome measures used were VAS scale for measuring pain, ROM of the shoulder joint movements using goniometer, power of the muscle assessed through MMT, quality of sleep assessed through Pittsburgh sleep quality Index and Shoulder pain and disability index (SPADI). 60 Subjects were divided into two groups; Group-A and Group-B, 30 patients in each group. A pretest measurement and Posttest with the help of following measures-

Visual analogue scale, Pittsburg sleep index, Goniometer for range of motion, Shoulder pain and disability index (SPADI) was done in each group.

Group A received Movement with mobilization by the therapist standing on the opposite side to the involved shoulder of the patient. Therapist uses the hand on the spine of the scapula to depresses abduct and limit upward rotation. Simultaneously, the clavicle and scapula are approximated between the two hands of the therapist correcting scapular winging and facilitate more appropriate scapula-thoracic relations (11). The patient now elevates the arm through flexion, abduction and extension in the plane of the scapula. (FIGURE 1) Mulligan MWM was applied for four days continuously by following the rule of 3 i.e.; 1st day 3 glides, 2nd day 3 sets of six glides, 3rd day sets of 10 glides were given and 4th day again 3 sets of 10 glides was given. The treatment was applied four times per week for 2 weeks, for a total 8 times.

Group B received Grade- III & IV Anterior glide, posterior glide, inferior glides. In forward stride position, the participant arm supported against thigh and outside hand. This position provides grading distraction, the ulnar border of the other hands placed just distal to the posterior angle of the acromion process (12). This proximal hand provides the mobilizing force posterior, anterior and inferior for gliding. (FIGURE 2)

Outcomes

The pain VAS is a one-dimensional measure of pain intensity, which has been widely used in diverse adult populations, including those with adhesive capsulitis. The Pittsburg sleep quality index (PSQI) effectively measures the pattern and quality of sleep. It differentiates “poor” from “good” sleep quality by measuring nineteen individual items generates seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of medications, and dysfunctions during the day over the last month. It is a self-rated questionnaire. Consisting of 19 items, the PSQI measures several different aspects of sleep, offering seven component scores and composite score. The global PSQI score is then calculated by totaling the seven component scores, providing an overall score ranging from 0-21, where lower score denotes healthier sleep quality. The Shoulder pain and disability index (SPADI) is a self-administered questionnaire that consists of two dimensions, one for pain and other for functional activities. The pain dimension consists of five questions regarding the severity of an individual’s pain. The SPADI takes 5 to 10 minutes for a patient to complete and is the only reliable and valid region-specific measure for the shoulder (13).

Analysis and Result

Data analysis from Group A (Movement with Mobilization) and Group B (Graded Mobilization) were analyzed by using paired sample t-test to measure the changes between the pre and posttest values within the group and independent t-test was done to measure the changes between group analysis. All these statistical analysis were performed through SPSS-16 version. Between group analysis is depicted in the Table 1. The result shows that Movement with mobilization

technique is an effective technique for improving ROM and sleep, reducing pain and instability among adhesive capsulitis patients and Graded mobilization technique is an effective technique for improving ROM and sleep, reducing pain and instability among adhesive capsulitis patients. When both Group A and Group B compared on between group analysis, the result concluded that the Movement with mobilization technique is more effective than Graded mobilization technique for improving sleep, flexion, extension, abduction and internal rotation ROM and reducing pain and instability among adhesive capsulitis patients.

Discussion

This study was designed to know the efficacy of Movement with Mobilization technique in the treatment of adhesive capsulitis of shoulder for improving flexion ROM, extension ROM, abduction ROM and internal rotation ROM and sleep and reducing pain and instability by comparing with Graded Mobilization technique. This study included 2 groups: Group A and Group B. The result of this study indicates that Group A shows significant difference in the flexion ROM, pain and instability when compared with Group B. This study compared the effects of two treatment strategies: Movement with Mobilization technique and Graded Mobilization technique. The aim of mobilization mechanical forces lead leads to breaking up of adhesions, realigning collagen and also maintains joint mobility by reducing biological changes in synovial fluid and their enhanced exchange. Graded mobilization technique is thought to increase the proprioceptive and kinesthetic sensation in the joint thus individuals can do the activities in a newly gained range of motion (14).

The concept of mobilization with movement is that it is a natural continuance of the progression in the field of manual therapy which starts from active stretching exercise and later applied by therapist to give passive physiological movement to passive accessory mobilization technique. Movement with mobilization is the latest application of a sustained accessory mobilization performed by the therapist and an active physiological movement to end range performed by the patient (9). No pain is caused while delivering Passive end range over pressure or stretching. Mulligan suggested that the Movement with mobilization technique has its effect in the positional faults in the joints that occur due to injuries or strain by correction (11). It is proven that the improvement of shoulder external rotation which could be due to the neurophysiological activities by the application of mobilization with movement to the elbow for lateral epicondylgia which helps to move shoulder through a wider range of motion. Previous literatures have discussed that mobilizations consisted of adhesion breaking through the mechanical forces, specific motions that align the fiber glides on specific administration of stress at a particular site over the capsule (15).

In this study Movement with Mobilization technique- Group A and Graded Mobilization- Group B was an effective treatment for adhesive capsulitis in improving instability score, flexion ROM, extension ROM, abduction ROM, internal rotation ROM, sleep and reducing pain. But between group analysis result shows the Group A Movement with Mobilization technique is more effective than Group B Graded Mobilization in improving sleep, flexion, extension, abduction and internal rotation ROM and reducing pain and instability score.

That is movement with mobilization treatment gave better effectiveness among the outcome measures of pain, sleep, instability, flexion ROM extension ROM, abduction ROM, internal rotation ROM.

It shows that there is a clinical significant improvement of patient's complaints in both groups. But the statistical inference shows that there is significant improvement in Group A when compared with Group B in improving sleep, flexion, extension, abduction and internal rotation ROM and reducing pain and instability score. That is Movement with Mobilization technique is more effective in treating adhesive capsulitis of shoulder joint. This study shows that Movement with Mobilization technique is more effective than Graded Mobilization technique to adhesive capsulitis of shoulder joint.

Figure 1



MWM FOR FLEXION, EXTENSION, ABDUCTION AND INTERNAL ROTATION

Figure 2



GRADED MOBILIZATION

Table 1: Between Group Analysis Of All The Outcomes

outcomes	analysis	group	mean	t-value	p- value
Pain (VAS)	PRE	A	4.87	1.703	0.094
	PRE	B	4.23		
	POST	A	0.37	8.063	<.001
	POST	B	2.53		
Sleep (Pittsburg)	PRE	A	16.57	0.971	0.336
	PRE	B	15.70		
	POST	A	1.40	9.673	<.001
	POST	B	8.50		
Instability	PRE	A	64.50	1.699	0.095

(SPADI)	PRE	B	58.87	-3.388	0.001
	POST	A	30.97		
	POST	B	41.20		
Shoulder flexion ROM	PRE	A	112.93	1.559	0.125
	PRE	B	101.27		
	POST	A	133.00	3.526	<.001
	POST	B	108.43		
Shoulder extension ROM	PRE	A	25.97	6.131	<.001
	PRE	B	39.73		
	POST	A	54.40	4.862	<.001
	POST	B	45.80		
Shoulder abduction ROM	PRE	A	98.70	3.559	0.007
	PRE	B	117.63		
	POST	A	153.63	5.199	<.001
	POST	B	125.07		
Shoulder internal rotation ROM	PRE	A	32.80	7.197	<.001
	PRE	B	53.60		
	POST	A	67.30	3.098	0.003
	POST	B	57.33		

(p-value< 0.05 considered as statistically significant)

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