

Effectiveness of Maitland vs. Mulligan Mobilization Techniques in Adhesive Capsulitis of Shoulder Joint

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ABSTRACT

Introduction

Frozen shoulder is one of the common conditions that we treat in our clinics on daily basis. It is due to restriction of accessory motions in Gleno-Humeral joint that will result in decreased anatomical movements of shoulder joint. It has a specific pattern of movement restriction mainly passive Lateral Rotation, Abduction and Flexion are affected most. Exercises are very effective in treatment, management and prevention of shoulder impairments. .

Objectives

To determine the effectiveness of Maitland vs. Mulligan Mobilization Techniques in Frozen shoulder in terms of Shoulder Pain and Disability (SPADI) Score and Range of motions of Shoulder joint.

Methods

It is a Prospective Randomized Clinical Trial conducted in Department of Physical Therapy Mayo hospital Lahore after the approval of Ethical Review Committee. Patients of either gender having developed frozen shoulder with primary or secondary cause presenting with capsular pattern are included in the study. 40 Subjects (n=40) who fulfill inclusion criteria were selected, by Simple random sampling method using closed envelopes, randomly allocated subjects into two groups. In each group 20 patients were included. One group was given Maitland mobilization (Group A) and other was treated with Mulligan mobilization (group B) but both receive conservative exercise plan as well. Both groups also followed conventional exercises till 6 weeks and shoulder range of motions and SPADI Questionnaire parameters were recorded at the beginning and at the end of 6th week visit of the patients. Analysis was done using SPSS.

Results

Total 40 patients (8 males and 32 females) participated in this study. Mean age of group A patients was 52.80 years and means age of group-B was 53.60 years. Patients in group A were treated with Maitland mobilization technique along with exercises and group B were treated with Mulligan mobilization technique along with exercises. Improvements in Shoulder range of motions are observed in both groups i.e. Group A External Rotation improves from 51.25 to 64.45, Abduction from 86.45 to 107.80 and Flexion from 90.50 to 109.05 while in group B External Rotation improves from 51.80 to 72.20, Abduction from 90.55 to 128.85 and Flexion from 96.75 to 134.50. Both groups show improvements in range of motions but Group B improvements in ROMS are much higher than Group A. SPADI Score also shows significant reduction in case of Group B from 82.45 to 68.50 while in Group A it reduces from 86.75 to 76.45. Both intervention reduces the SPADI score significantly but group B values are much higher reduced.

Conclusion

Improvements in Range of motions and Reductions in SPADI score are high in Mulligan Group.so it is more effective than the other technique.

Key words; Frozen shoulder, Mulligan's technique, Maitland, Manual therapy, ROM.

INTRODUCTION

Adhesive capsulitis is a painful and restriction in range of motions actively and passively particularly lateral rotation and abduction due to fibrosis and contracture of the joint capsule. Adhesive capsulitis is also denoted as frozen shoulder. (1). Diagnosis based on capsular pattern of shoulder joint.(2). Frozen shoulder is more disposed in diabetic and hemiplegic patients(3). According to Reeves stages of frozen shoulder, First Freezing or painful stage: pain (last for duration of 2-9 months). Second Frozen or transitional stage: stiffness lasts for 4-12 months. Third Thawing stage in which pain resolves almost but

decreased range of motion.(4). Adhesive capsulitis categorized as primary frozen shoulder which is idiopathic and secondary is traumatic capsulitis along with any other medical condition.(5) The aim of treating adhesive capsulitis is to increase range of motion regain function and to relief patient clinical symptoms include limited range of motion, weakness of muscles and pain.. In some cases adhesive capsulitis is a self-limited , lasting for 6 months and it may causes long term disability more cases of frozen shoulder seen in diabetic patients range from 10%to 20% (6). The incidence of adhesive capsulitis in general population is 2-5% (7). Adhesive capsulitis is more seen

in females with age range from 40-70 years. There are many treatment methods like rest, analgesics, physical therapy, electrotherapy, manipulation under anesthesia, trans cutaneous nerve stimulation, Ultrasound therapy heat packs.(8) Mulligan concept is the detailed examination, investigation and cure of neurological and musculoskeletal disorders through manipulative physical measures(9). Maitland has four grades of mobilization 1: low amplitude within the ROM. 2: big amplitude beyond end ROM. 3: Large amplitude within the limited range of motion. 4: low amplitude with limited ROM. (9) Mulligan concept of mobilization with movement(MWM) was introduced for peripheral joints (10, 11) This technique involves the application of sustained gliding forces on a joint along with Osteo-kinematic movements performed actively and passively by the patient and therapist respectively and mobilization technique is used to reposition the bony positional faults. (10, 11)

If thickness of capsule and synovial membrane increases than 4mm it is an important criteria in diagnosis of frozen shoulder(12). The treatment of patients suffering from adhesive capsulitis is very long and takes time despite many therapeutic interventions(13) Mulligan's (MWM) technique describes effectiveness and benefits of this technique in their studies(14).

Many techniques, such as mobilization and manipulation techniques, are beneficial to regain a normal functions of the upper limb and pain Free State. Manual and manipulative treatment applied on patients with adhesive capsulitis are end-range mobilization, mid-range mobilization, and mobilization with movement (MWM) and high velocity low amplitude manipulation of the shoulder joint and other joint of girdle (15). Physical therapy treatment program for patients with frozen shoulder includes exercises to recover normal physiological shoulder motions and muscle activity(16).

There are two types of frozen shoulder primary which is idiopathic in nature and secondarily which is due any other disease. Clinical features of both (primary and secondary) types of FS have similar but different risk factors are contributing in this disease process(17). Primary frozen shoulder also called "true frozen shoulder no existing cause. Its presenting features are decreased Rom's with no diagnosis of systemic disease, and radiographs will help the diagnosis (18, 19). Secondary frozen shoulder is caused by both internal and external factors which leads to pain lack of functions and stiffness; e.g. diabetes, stroke, hypothyroidism and Hyperthyroidism, rotator cuff injury, cardiac dysfunctions and trauma (20) (21, 22)

In capsulitis there is insidious loss of mobility of glenohumeral joint occurs due to joint contractures however researchers found that the etiology and pathology of frozen shoulder is enigmatic.(23, 24). The risk of developing adhesive capsulitis in patients with type 1 diabetes is around 40%. It affects on both sides either at the same time or gradually in 16% patients. The patient suffering from diabetes mellitus effected bilaterally rather than in other subjects.(17)

Conventional Exercise Plan: The following exercises were performed by the patients of both groups other than Manual therapy techniques of respective group.

Pendulum exercise, Isometric Scapular Retraction, Rotator cuff exercise, Wall creeping exercise, Active assisted ROM exercises, Codman exercises

Each exercise was performed for all movements namely flexion extension and abduction-adduction, one sets of each 10-15 repetitions within pain-free range and instructed to carry out their ADLs.

METHODOLOGY

It is a Prospective Randomized Clinical Trial conducted in Department of Physical Therapy Mayo hospital Lahore after the approval of Ethical Review Committee. Patients of either gender having developed frozen shoulder with primary or secondary cause presenting with capsular pattern are included in the study. Those who have shoulder arthritis, hemiplegia, shoulder surgery and any other systemic disease are excluded in the Data was collected after Providing information to the patients and taking informed consent from patients or their attendant. 40 Subjects (n=40) who fulfill inclusion criteria were selected, by Simple random sampling method using closed envelopes, randomly allocated subjects into two groups. In each group 20 patients were included. One group was given Maitland mobilization (Group A) and other was treated with Mulligan mobilization (group B) but both receive conservative exercise plan as well. Results were compiled accordingly Patients were treated for 6 weeks. Information has been given about the study and a written consent was taken. All the patients follow 6 weeks exercise plan on Alternate basis, they receive their respective group treatment along with conventional Exercise Plan. Data was recorded through Shoulder Pain and Disability Index (SPADI) Score (25,26) and Shoulder Range of Motions by using Goniometry at the beginning of trial and end of trial. (26).

Statistical Analysis: Data was analyzed through SPSS [statistical package for social sciences] version 16.0 All quantitative variables were presented in Mean \pm SD. T – test will be applied to compare the mean difference of qualitative variables. .p-value <0.05 will be taken.

RESULTS

The study included 40 subjects, 8 males and 32 females with mean age 52.80 in Group A and mean age 53.60 in Group B. Table 1 shows pre interventions parameters i.e. SPADI score and shoulder Range of Motions.

Table 1: Various pre intervention parameters in both the groups

PARAMETERS	MAITLAND	MULLIGAN
Age	52.80	53.60
Gender (M:F)	4:16	4:16
SPADI	86.75	82.45
Flexion	90.50	96.75
Extension	38.75	39.00
Abduction	86.45	90.55
Internal Rotation	45.75	45.50
External Rotation	51.25	51.80

Table 2: Within group analyses of outcome variables in both the groups

PARAMETERS	MAITLAND			MULLIGAN		
	Pre	Post	p-value	Pre	Post	p-value
SPADI	86.75±6.83	76.45±4.93	.105	82.45±7.76	68.50±7.22	.000
Flexion	90.50±20.25	109.05±21.93	.000	96.75±18.22	134.50±12.55	.000
Extension	38.75±5.45	48.35±4.99	.021	39.00±5.02	51.50±12.15	.704
Abduction	86.45±18.66	107.80±15.95	.000	90.55±12.92	128.85±12.42	.000
Internal Rotation	45.75±6.54	58.65±5.83	.013	45.50±3.94	61.75±6.34	.054
External Rotation	51.25±8.86	64.45±6.20	.001	51.80±8.30	72.20±9.34	.003

Improvements in Shoulder range of motions are observed in both groups i.e. Group A External Rotation improves from 51.25 to 64.45, Abduction from 86.45 to 107.80 and Flexion from 90.50 to 109.05 while in group B External Rotation improves from 51.80 to 72.20, Abduction from 90.55 to 128.85 and Flexion from 96.75 to 134.50. Both groups show improvements in range of motions but Group B improvements in ROMS are much higher than Group A. SPADI Score also shows significant reduction in case of Group B from 82.45 to 68.50 while in Group A it reduces from 86.75 to 76.45. Both intervention reduces the SPADI score significantly but group B values are much higher reduced.

DISCUSSION

Physical Therapy treatment such as exercises, thermotherapy and heat modalities, medical treatment, the traditionally applicable treatments in adhesive capsulitis. According to available literature there are many controversies regarding its effective purpose, PT is first line treatment of frozen shoulder (27) many different interventions are being used to treat patients and being researched. Adhesive capsulitis publically known as frozen shoulder is a condition with restricted range of movement and capsular pattern (restricted external rotation and abduction).(28)

The unresolved long standing pain in AC Joint usually associated with sympathetic system involvement which does not readily resolve with exercise therapy(12) The sympathetic trunks are present lateral to the costovertebral joints in the thorax. Mechanical deformation occurs during trunk and body motions in sympathetic chains. They are vulnerable to mechanical interference from pathological changes.(12). Assessment of thoracic and cervical are recommended to rule out an impairment in this area which might be causative factor to adhesive capsulitis. Manipulative adjustments in the neck and thoracic spine have had a better outcome in terms of increased range of motions and reduced pain(13). Other manual therapy techniques which effectively manage dysfunction in these areas are METs and Positional Release Technique(PRT).(5,6) Literature suggest exercise therapy should be tried first and considered to be integral part of management for the treatment of above discussed dysfunctions of shoulder region. (13)

The interventions that give early relief to the patients with less negative effects should be preferred. Frozen shoulder was diagnosed in the presence capsular pattern. It is a long standing condition which disturbs patient daily life and having associated with improvements in symptoms. Many studies were conducted on both techniques to assess their effectiveness. They are equally effective in

terms of SPADI and range of motions but Mulligan techniques had given a marked difference in their scores. Mobilization decreases pain by activating peripheral mechanoreceptors and the inhibiting the pain pathway. Hence pain symptoms decreases (17).

Shoulder ranges were improved by both techniques. In our studies parameters i.e. Abduction and flexion Ranges were considerably increased in group -B (Mulligan group), but other anatomical movements extension, medial rotation and external rotation both the techniques given same results. Very less studies been published on these techniques in comparing their effects with each other but both are equally effective in treating shoulder impairments in combination with different exercises.

CONCLUSION

Improvements in Range of motions i.e. Abduction and Flexion and Reductions in SPADI score are high in Mulligan Group.so it is more effective than the other technique whereas improvement in extension, lateral rotation and medial rotation did not show marked difference. So Mulligan techniques are markedly effective in treating frozen shoulder.

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