



Comparing the Effectiveness of Maitland Mobilization Technique and Muscle Energy Technique on Pain, Range of Motion and Functional Activities in Adhesive Capsulitis

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ABSTRACT

Objective: To find out the effect of Maitland Mobilization Technique versus Muscle Energy Technique on pain, range of motion and functional activities among subjects with Adhesive Capsulitis.

Method and Subjects: 28 subjects with aged 40-65 years were selected for this study. They were randomly divided in to two groups. Group A- 14 Subjects were received Maitland Mobilization Technique, Group B- 14 Subjects were received Muscle Energy Technique for a period of 2 weeks. The pre and post score values of pain were measured by NPRS, for all shoulder ROM by goniometer and functional activities by SPADI. Data were analyzed by SPSS-20 to determine the effects of both the treatment regimens on the same outcome measures.

Results: The patients with adhesive capsulitis who treated with Maitland Mobilization Technique and Muscle Energy Technique both showed significant improvement ($p < 0.001$) on pain, shoulder range of motion and the Shoulder Pain And Disability Index scores in adhesive capsulitis. On analyzing the data between groups, there was a clinical improvement but statistical insignificant was noticed ($p > 0.05$) for all parameters.

Conclusion: The study confirmed that both Maitland Mobilization Technique and Muscle Energy Technique had better effect on pain, range of motion and improving functional activities. But comparing both groups was insignificantly changes for all parameters.

Key Words: Adhesive Capsulitis, Maitland Mobilization Technique, Muscle Energy Technique, Numerical Pain Rating Scale, Range of Motion, Shoulder Pain and Disability Index

INTRODUCTION

The term adhesive capsulitis is a well-defined shoulder disorder characterized by progressive pain and stiffness of shoulder which resolves after 18 months period the cause remain unknown which is due to fibroblastic proliferation in the rotator interval anterior capsule and coraco-humeral ligament⁽⁴⁾. The annual incidence of adhesive capsulitis in the general population in approximately 3 to 5% and up to 20% in people with diabetes. It is most frequently found in patients between the fourth and sixth decades of life and it is more common in

women than men⁽²⁰⁾. Duplay in 1896 first described about this condition and named as periarthritis scapula humerale identifying as the lesion of periarticular structures⁽¹⁹⁾. Nevasier coined the term adhesive capsulitis to describe a contracted thickened joint capsule that seemed to be drawn tightly around the humeral head with a relative absence of synovial fluid and chronic inflammatory changes with the synovial layer of the capsule⁽³⁾. The movements will be restricted in all planes without any radiological abnormalities and both active and passive movements will be painful and restricted with external rotation and abduction limited to the maximum⁽¹⁹⁾. The Etiology

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remains unclear, adhesive capsulitis can be classified as primary or secondary. Frozen shoulder is considered primary if the onset is idiopathic while secondary results from a known causes or surgical event. Three subcategories of secondary frozen shoulder include systemic – Diabetes mellitus and other metabolic conditions. Extrinsic – cardiopulmonary disease, cervical disc disease, Cerebrovascular accident, humerus fractures, Parkinson's disease. Intrinsic factors rotator cuff pathologies, biceps tendonitis, calcific tendonitis, Acromioclavicular joint, arthritis⁽²¹⁾.

The disease process affects the anterosuperior joint capsule, maxillary recess, and the coraco-humeral ligament. It has been shown through arthroscopy that patients tend to have a small joint with loss of the axillary fold, tight anterior capsule and mild or moderate synovitis but no actual adhesions. Contracture of the rotator cuff interval has also been seen in adhesive capsulitis patients, and greatly contributes to the decreased range of motion seen in this population.

Consists of Three Phases: Painful Phase Gradual onset of shoulder pain at rest with sharp pain at extremes of motion and pain at night with sleep interruption which may last anywhere from 3-9 months. Stiffening Phase: Pain starts to subside, progressive loss of glenohumeral motion in capsular pattern, pain is apparent only at extremes of movement. This phase may occur at around 4 months and last till about 12 months. Thawing Phase: Spontaneous, progressive improvement in functional range of motion which can last anywhere from 1 to 3.5 years (21). In phase II, the contracted capsule does not allow normal free movement of the shoulder which causes the scapula to move excessively in upward rotation and lateral trunk lean to compensate for the loss on glenohumeral rotation(3). The capsular pattern of restricted range of shoulder motion in adhesive capsulitis is external rotation, abduction and internal rotation. In adhesive capsulitis of shoulder, there will be proportional limitation in all movements of the glenohumeral joint in all planes (7). Pain, active movements (External rotation, abduction, internal rotation and flexion) and functional outcomes were used as primary outcome measures because they are important features in adhesive capsulitis of shoulder. Physiotherapy intervention usually used for the management of this specific condition are heat or cold modalities. Active exercise, Maitland Mobilization Techniques and Muscle Energy Techniques. Maitland Mobilization Techniques and Muscle Energy Techniques is an important part of intervention which includes the normal physiological movement and the accessory movement.

MATERIAL AND METHODOLOGY

The study design was a Prospective, open labelled, quasi-experimental comparative design. The Study was done in the Department of Orthopedics & Department of Physical

Medicine and Rehabilitation, PSG Hospitals Coimbatore. The period June 2017- April 2018. The study approval from the PSG institutional of medical science and research- Institutional Human ethical committee reference project No: 17/126 date approved 06.07.2017. Participants (n=34) with adhesive capsulitis were recruited from the orthopedics PMR department. 28 subjects met the inclusion criteria and accepted to consent. They were randomly allocated into 2 groups by simple random sampling method. The Selection Criteria were with the age group of 40-65 years, both male and female, Apley's scratch test positive, Painful phase and stiffening phase of adhesive capsulitis and those who will consent to participate were included. The subjects Shoulder dislocation, Upper limb neurological deficit, trauma to the joint structure and soft tissue particular shoulder, Thoracic outlet syndrome, Manipulation under anesthesia condition, pathology neck pain, those who Received physiotherapy for the same problem before 3 months, Myocardial infarction, Red flags to mobilization. Study Materials Assessment chart, Goniometer (universal), Shoulder Range of motion (goniometer), Numerical pain rating scale (NPRS), Shoulder Pain And Disability Index (SPADI) were used for pre and post measures. Treatment Duration week for 2 weeks. Group A- 14 Subjects – Received Maitland Mobilization Technique (Figure No: 1). Group B- 14 Subjects – Received Muscle Energy Technique (Group Figure No: 2).

RESULTS

Statistical Analysis and Interpretation

The Mean, Standard deviation and Paired-t test, Independent-t test values were used to find out any significant difference between the two groups. (Group A and B). Data collected from Group A (Maitland Mobilization Technique) and Group B (Muscle Energy Technique) were analyzed by using paired t-test to measure the changes between the pre and post-test 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-20 Version.

Within Group Analysis

The Group A (Maitland Mobilization Technique) for the Pain 't' value 5.229 ($p < 0.001$). Shoulder abduction 't' value was 8.850 ($p < 0.001$) and the shoulder external rotation 't' value was 5.375 ($P < 0.001$). For SPADI 't' value was 18.666 ($P < 0.001$) (Table: 1 & Graph: 1). For Group B (Muscle Energy Technique) the Pain 't' values was 17.542 ($p < 0.01$) Shoulder abduction 't' value 8.140 was ($p < 0.001$). Shoulder external rotation 't' value was 7.380 ($p < 0.01$). For SPADI 't' values was 24.577 and ($p < 0.01$) (Table: 2 & Graph: 1). Which should that both Maitland Mobilization Technique and Muscle Energy Technique were effective on reducing

pain, improving range of motion and functional activities among Adhesive Capsulitis patients.

Between Group A and Group B Analysis

The pre and post test results of Group A and Group B shows that there is a statistical and clinical significant effect of each technique on reducing pain, improving ROM, and functional activities among Adhesive Capsulitis patients. Maitland Mobilization Technique & Muscle Energy Technique both groups analysis the result shows that Maitland Mobilization Technique and Muscle Energy Technique insignificant changes of pain, range of motion and functional activities (Table 3 & Graph 1).

DISCUSSION

Shah Atika Suri (2013) did a study on physical therapy treatment of Adhesive Capsulitis and concluded that both Maitland Mobilization technique and Muscle Energy Technique are an effective treatment for adhesive capsulitis but Maitland Mobilization is more effective in increasing both active and passive joint ROM, while MET is more effective in reducing pain in patients with adhesive capsulitis. In this study also we found that there is a reduction of pain which helped patients to improve their range in abduction and external rotation of affected shoulder joint on comparison the Maitland Mobilization group got better range than Muscle Energy Technique group.

Abhay Kumar (2012) in their a study concluded that the Maitland Mobilization technique with supervised exercise protocol was more effective on relieving pain, Improving Range of Motion and shoulder function and hence should form a part of the treatment plan. In this study Maitland Mobilization Technique got better improvement in ranges than Muscle Energy Technique group.

Narayan et. al., (2014) conducted an experimental study and found that MET is very much effective than conventional treatment group on functional ability of shoulder (SPADI) in adhesive capsulitis. In this study Maitland Mobilization Technique and Muscle Energy Technique were effective in adhesive capsulitis on Improving shoulder pain and disability index (SPADI). But between group analysis group A Maitland Mobilization Technique and Muscle Energy Technique Group B show ineffective in bring changes in shoulder pain and disability index (SPADI). It show that there is a clinical significant improvement of patient's complaints in both groups. But the statistical inference shows that there is no significant difference between both groups that is both treatments gave equal effectiveness among the outcome measure of adhesive capsulitis patients.

CONCLUSIONS

The study was intended to compare the Effectiveness between Maitland Mobilization Technique and Muscle Energy Technique both in the treatment of Adhesive Capsulitis. The Maitland Mobilization Technique and the Muscle Energy Technique both were found effective in the treatment of adhesive capsulitis. The technique showed clinical and statistical effectiveness on the parameters. Chosen the reduction on pain in both groups, improved of range of motion in both shoulder abduction and external rotation was found. There was an improvement in the functional activities of patients in both groups. There was a clinical significant improvement of patient's complaints in both groups. That is both treatment gave equal effectiveness among the outcomes measures which was noticed statistically, which can be recommended in the management of Adhesive capsulitis.

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ABBREVIATIONS

MMT - Maitland Mobilization Technique
MET - Muscle Energy Technique
NPRS - Numerical Pain Rating Scale
ROM - Range Of Motion
SPADI - Shoulder Pain and Disability Index

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Table 1: Group A Maitland Mobilization Technique Pre and Post Values of Pain, ROM and SPADI Within Group Analysis

OUTCOME	ANALYSIS	Mean	Mean difference	Standard Deviation	t value	p value	Results
PAIN	PRE	7.428	6.071	1.491	5.229	0.001	Significant
	POST	1.357					
SHOULDER ABDUCTION	PRE	115	53.21	22.498	8.850	0.001	Significant
	POST	168.21					
SHOULDER EXTERNAL ROTATION	PRE	33.214	19.285	13.424	5.375	0.001	Significant
	POST	57.50					
SHOULDER PAIN AND DISABILITY INDEX (SPADI)	PRE	62.35	5.1500	10.323	18.666	0.001	Significant
	POST	10.85					

Table 2: Group B Muscle Energy Technique Pre and Post Values of Pain, ROM and SPADI within Group Analysis

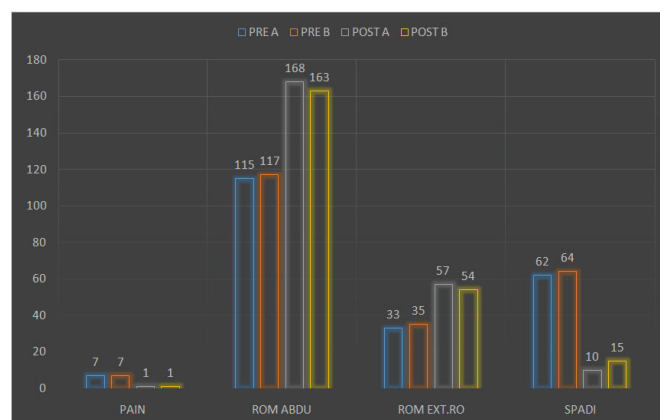
OUTCOME	ANALYSIS	Mean	Mean difference	Standard Deviation	t value	p value	Results
PAIN	PRE	7.214	5.428	1.157	17.542	0.01	Significant
	POST	1.785					
SHOULDER ABDUCTION	PRE	117.5	46.42	21.342	8.140	0.001	Significant
	POST	163.92					
SHOULDER EXTERNAL ROTATION	PRE	35	19.285	9.777	7.380	0.01	Significant
	POST	54.285					
SHOULDER PAIN AND DISABILITY INDEX (SPADI)	PRE	64.642	4.9500	7.5	24.557	0.01	Significant
	POST	15.142					

Table 3: Pre and Post Test Values of Maitland Mobilization Technique and Muscle Energy Technique between Group Analysis

OUTCOMES	ANALYSIS	Mean	t value	p value	Results
PAIN	PRE A	7.428	1.191	0.245	Not significant
	PRE B	7.214			
	POST A	1.357			
	POST B	1.785			

Table 3: (Continued)

OUTCOMES	ANALYSIS	Mean	t value	p value	Results
ROM ABDUCTION	PRE A	115	0.296	0.770	Not significant
	PRE B	117.5			
	POST A	168.21			
	POST B	163.92			
ROM	PRE A	33.214	1.091	0.285	Not significant
	PRE B	35			
	POST A	57.50			
	POST B	54.285			
SHOULDER PAIN AND DISABILITY INDEX (SPADI)	PRE A	62.35	0.489	0.629	Not significant
	PRE B	64.642			
	POST A	10.85			
	POST B	15.142			



Graph 1: Graphical Representation on comparison of Maitland Mobilization Technique and Muscle Energy Technique on Pain, Range of Motion and Functional Activities



Figure 2: Muscle Energy Technique Group B.



Figure 1: Maitland Mobilization Technique Group A.