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A comparative study between the efficacy of maitland mobilisation and muscle energy techniques in stage ii shoulder adhesive capsulitis

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Abstract
Background and Purpose: Idiopathic adhesive capsulitis is defined as a self-limiting condition of unknown etiology. It is characterized by restriction in the shoulder range of motion in a capsular pattern. Principles of treatment of adhesive capsulitis are to relieve pain, maintain ROM and ultimately to restore function.
The purpose of this study is to find out the effectiveness of maitland technique and muscle energy technique in decreasing pain and increasing ROM in patients with stage II idiopathic shoulder adhesive capsulitis.
Methodology: Patients from private clinic and department diagnosed with shoulder adhesive capsulitis were included in this study. Subjects were selected from both the gender between 40-60 years of age with capsular pattern. In respective with the criteria of the study 10 participants were filtered for the study and were randomized to 2 groups for 2 types of treatment. Group A was given Maitland Technique and group B was given METS. The outcome measure was taken by using SPADI, VAS and goniometer.
Results: Descriptive analysis of 10 subjects using excel calculations and the graphs reveals that there was significant improvement in the outcome measures of group A who received Maitland mobilization when compared to group B who received METS.
Observation: Both the treatment procedures were relatively good but the group A which received Maitland Mobilization improved the value of outcome measure in a positive aspect.

Keywords: adhesive capsulitis, mobilization, METS

Introduction
Adhesive capsulitis is a shoulder condition defined as an insidious onset of pain and a gradual loss of both passive and active range of motion (ROM) in the affected shoulder [20].
The capsular pattern in the shoulder is characterized by limitation of passive range [1]. According to G.D. Maitland, passive oscillatory movements two or three per second of small or large amplitude can be applied anywhere in a range of motion for treating joint dysfunction. Maitland's description of grades of joint movements has been a major contribution to manual therapy. Grade I & II oscillations are used for pain relief, Grade III & IV oscillations are used for joint stiffness.
MET is generally classified as direct technique as opposed to indirect because the muscular effort is from controlled position in a specific direction against a distant counter force.

Objective
Is to evaluate the efficacy of Maitland mobilisation and Muscle energy technique and comparing both in the treatment of patients with stage II adhesive capsulitis.

Null Hypothesis [H0]
There is no significant difference in improvement in the pain free range of motion and shoulder pain and disability index between Maitland Mobilisation and Muscle Energy Technique in the treatment of shoulder adhesive capsulitis.

Experimental Hypothesis [H1]
There is a significant difference in improvement in the pain free range of motion and shoulder pain and disability index between Maitland Mobilisation and Muscle Energy Technique in the treatment of shoulder adhesive capsulitis.

Methodology
Study Design: Quasi Experimental study
Study Setting: Meenakshi College of Physiotherapy, Chennai & Sai Ram Physiotherapy Clinic, Chennai
Size: 30
Method: Convenient sampling

Inclusion
- Age 40- 60 yrs [1, 14, 19].
- Shoulder ROM restriction (external rotation ≥ 60º, abduction ≥30º, internal rotation≥5º)
- Shoulder pain more than 3 months.
- Patients with adhesive capsulitis abduction test and external rotation test positive.

Exclusion
- Diabetes mellitus [4, 18].
- History of trauma or accidental injuries [10, 18].
- Neurological involvement (stroke, Parkinsonism, radiating pain to arm) [4, 10, 18].
- History of surgery on particular shoulder [18].

Materials
- Goniometer
- Treatment Couch
- SPADI evaluation chart

- VAS pain rating scale chart

Outcome Measures

- ROM [Range Of Motion]
- SPADI [Shoulder Pain and Disability Index [1, 11, 13, 14, 16].
- VAS Visual Analogue Scale [10, 25, 29].

Procedure

Pre-test measurements were taken with the help of Visual Analogue Scale, Shoulder Pain and Disability Index and goniometer prior to the intervention. The subjects (n=30) were selected and divided into two groups. Group A (n=15) patients were given Maitland's mobilization technique of suitable grades for 24 sitting in four weeks. Group B (n=15) patients were given muscle energy techniques for 24 sitting in four weeks. 3-5 muscle contractions with 5-7 seconds each contraction (not more than 20% of total muscle strength) for three repetitions. The patients attended physical therapy session daily, which is 6 days a week. Both group patients were given home exercise program (including mainly Codman's exercises and finger ladder exercises) on the 1st day of treatment session Patients were advised to do each exercise 2-3 times a day for 10-15 repetitions. Patients in both groups were assessed for same parameters (ROM and SPADI) at the end of 24th sitting of the treatment session. The improvements in the shoulder range of motion (ROM) and shoulder pain and disability index (SPADI) were compared.

Statistical Analysis

Table 1: Comparison of Mean Value of Post Test Between Group A and Group B (Vas)

VAS	Mean	S.D.	t-Test
Group A	4.46	0.99	4.52
Group B	5.40	0.91	

From the above table we have arrived the mean and standard deviation of post-test for Maitland Mobilisation (group A) group and Muscle Energy Technique (group B) group by using unpaired t-test:

1. The two-tailed P value equals 0.0005
2. Difference is considered to be extremely statistically significant
3. Mean of group A Post minus group B Post equals -0.93
4. 95 % confidence interval of this difference: from -1.38 to -0.49

So, we conclude that the group which has the lower mean (Maitland's) is more effective in the treatment of stage II adhesive capsulitis.

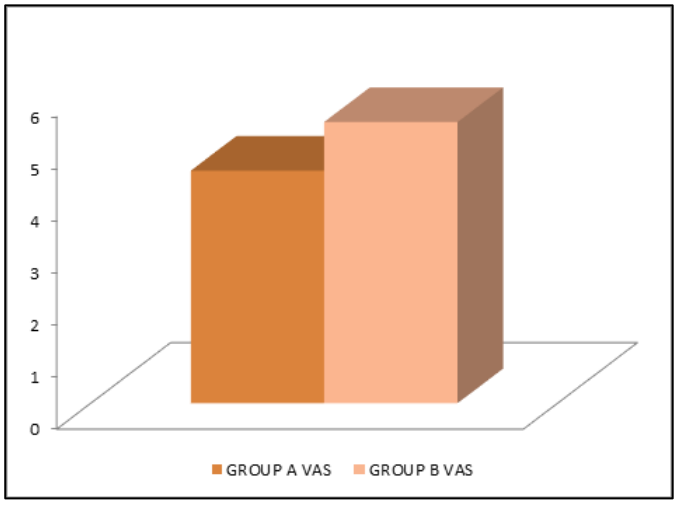

Fig 1: Comparison of Mean Value of Post Test between Group A and Group B (Vas)

Table 2: Comparison of Mean Value of Post Test between Group A and Group B (Spadi)

SPADI	Mean	S.D.	t-Test
Group A	44.81	9.01	2.51
Group B	56.64	11.65	

From the above table we have arrived the mean and standard deviation for Maitland Mobilisation (group A) and Muscle Energy Technique (group B). By using unpaired t test. The two-tailed P value is less than 0.0248 Difference is considered to be extremely statistically significant Mean of group A Pre minus group A Post equals -11.82 95 % confidence interval of this difference : from -21.91 to -1.73.

So, we conclude that the group which has the lower mean (Maitland's) is more effective in the treatment of stage II adhesive capsulitis.

Table 3: Comparison of Mean Value of Post Test between Group A and Group B Range Of Motion (Flexion)

SPADI	Mean	S.D.	t-Test
Group A	121.66	26.16	1.59
Group B	110.66	12.93	

From the above table we have arrived the post mean and standard deviation for Maitland Mobilisation (group A) and Muscle Energy Technique (group B).

By using unpaired t-test: The two-tailed P value equals 0.1325

1. Difference is considered to be extremely statistically significant Mean of group A Post minus group B Post equals 11.00 95 % confidence interval of this difference : from -3.77 to 25.77.
2. So, we conclude that the group which has the higher mean (Maitland's) is more effective in the treatment of stage II adhesive capsulitis.

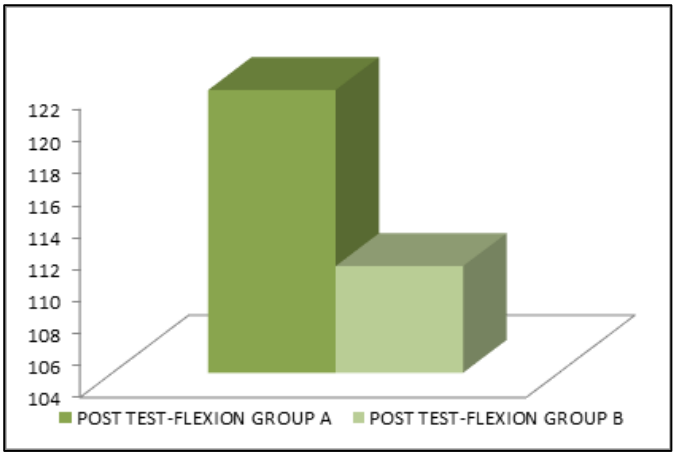

Fig 2

Table 4: Comparison of Mean Value of Post Test between Group A and Group B Range Of Motion (Abduction)

SPADI	Mean	S.D.	t-Test
Group A	104.00	22.37	1.13
Group B	95.33	19.03	

From the above table we have arrived the post mean and standard for Maitland Mobilisation (group A) and Muscle Energy Technique (group B).

By using unpaired t test:

1. The two-tailed P value equals 0.2741
2. Difference is considered to be extremely statistically significant
3. Mean of group A Post minus group A Post equals 8.67
4. 95 % confidence interval of this difference : from -7.66 to 25.00

So, we conclude that the group which has the higher mean (Maitland's) is more effective in the treatment of stage II adhesive capsulitis.

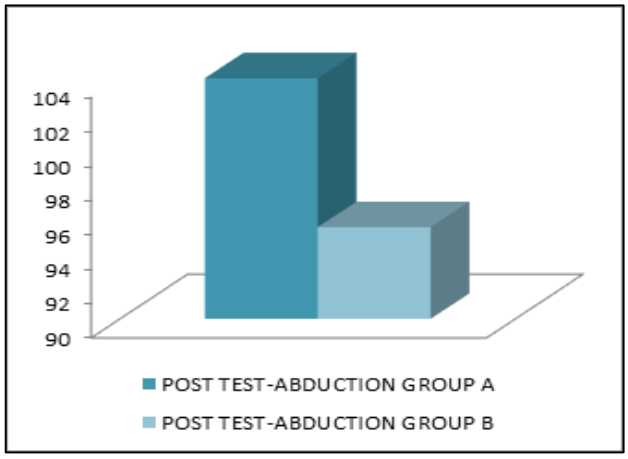

Fig 3

Table 5: Comparison of Mean Value of Post Test between Group A and Group B Range Of Motion (Lateral Rotation)

SPADI	Mean	S.D.	t-Test
Group A	13.33	2.43	1.91
Group B	11.60	2.92	

From the above table we have arrived the mean and standard deviation for Maitland Mobilisation (group A) and Muscle Energy Technique (group B).

By using unpaired t-test

1. The two-tailed P value equals 0.0768
2. Difference is considered to be not quite statistically significant
3. Mean of group A Post minus group A Post equals 1.73
4. 95 % confidence interval of this difference: from -0.21 to 3.68.

So, we conclude that the group which has the higher mean (Maitland's) is more effective in the treatment of stage II adhesive capsulitis.

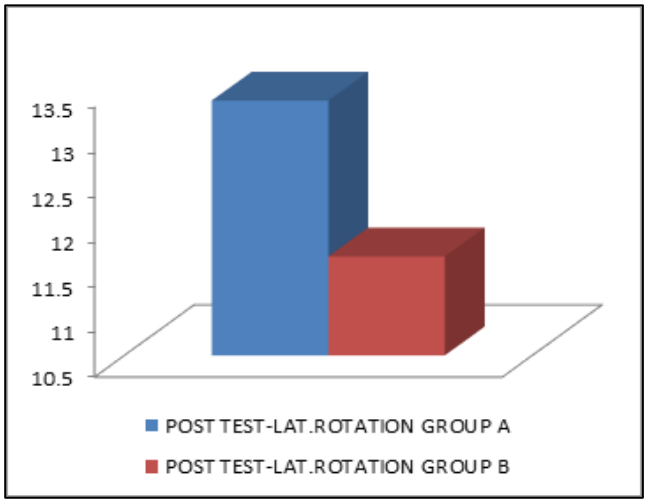

Fig 4

Discussion

Interpreting the results of the study, it shows that both Maitland mobilization and METS are effective in improving the ROM and decrease in pain in patient with adhesive capsulitis.

Abhay *et al* have conducted a clinical study to find the effectiveness of Maitland mobilization technique in the treatment of idiopathic shoulder adhesive capsulitis. The study confirmed that combination of shoulder exercises and Maitland mobilization technique results in relieving pain and improving ROM and shoulder function. [9] According to Norris, Muscle Energy Technique equals the resting tone of agonist and antagonist muscles and allow the joint to take up the balanced position, where joint surfaces are evenly loaded and inserted tissue at the joint are not excessively stressed. However, if muscles of one side of the joint are tight, the opposite muscle relax, the joint will pull out of alignment towards tight muscle. Demographic data of both the groups were seen similar with the expectations of duration of symptoms at the beginning of the study (pre-test). There were 15 males and 15 females in this study hence both the gender had almost equal representation. Both the groups have shown improvement in shoulder pain and disability score (SPADI) proving the improvement in shoulder function after the treatment. Rationale behind improvement in functional capacity might be due to ease in pain and increased range of motion which lessened suffering in daily activities, pain with specific task, and difficulty in moving arm and lifting actions. Both groups had reduction in their pain and improved their range of motion, but Group A improved better in terms of pain and range of motion.

Limitations
- The study duration is very short.
- Sample size is small

Recommendations
- Diabetic individuals can be included
- Use of single muscle for testing METs
- Other soft tissue manipulative techniques can be used for comparison

Conclusion
The results showed that both the interventions resulted in positive outcomes, but comparing the highest level of positive outcome within the interventions the Maitland technique imposed remarkable rate of recovery in regaining pain free range of motion when compared to the Muscle Energy Technique and is effective in the treatment of stage II adhesive capsulitis.

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