Comparison of Effectiveness of Maitland Mobilization and Muscle Energy Technique in Patients with Periarthritis Shoulder Using SPADI and NPRS

Mouleeswari.B¹, Senthil Kumar.S², Ramana. K³, Prathap Suganthirababu⁴, Jagatheesan Alagesan⁵

¹Undergraduate, ²Associate Professor, ³Assistant Professor, ⁴Professor, ⁵Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.

How to cite this article: Mouleeswari.B, Senthil Kumar.S, Ramana. K et. al. Comparison of Effectiveness of Maitland Mobilization and Muscle Energy Technique in Patients with Periarthritis Shoulder Using SPADI and NPRS. Indian Journal of Physiotherapy and Occupational Therapy / Volume 18, Year 2024.

Abstract

Background: Periarthritis shoulder is a shoulder ailment with no recognised cause. It gradually causes the shoulder’s range of motion to be restricted. Between 2% and 3% of the general population suffer from adhesive shoulder capsulitis, which most frequently develops between the ages of 40-65 years. The region gradually thickens, leading to shoulder stiffness and increase in pain.

Purpose: To compare the effectiveness of Maitland mobilization and Muscle energy technique in patients with periarthritis shoulder using SPADI and NPRS.

Materials and Methods: Subjects were randomly allocated into two groups. Maitland mobilization group (n = 33) and Muscle Energy Technique group (n = 33). The subjects were assessed using SPADI and NPRS for pre and post-test values. The one group treated with Maitland mobilization (grade 1 and 2) were given to the patients along with some exercises. The other group were treated with muscle energy technique along with some exercises. These interventions were given for 4 weeks. The entire process was conducted from November 2022 to April 2023.

Result: There was a significant improvement from pre-treatment levels in pain and ROM in Maitland mobilization group compared to muscle energy group.

Conclusion: Hence the study concludes that there is a more significant increase in ROM and SPADI score, and a significant decrease in pain on NPRS by Maitland mobilization as compared with Muscle energy technique.

Key Words: Periarthritis shoulder, Maitland mobilization, Muscle energy technique, SPADI, NPRS

Introduction

The shoulder is a multi-planar anatomical joint that allows for complicated movement. Exactly what drives this complex’s dynamic force and stability is regulated muscle movement.¹ Periarthritis shoulder is a shoulder ailment with no recognised cause.

The sneaky, excruciating illness known as “frozen shoulder” is adhesive capsulitis that gradually causes the shoulder’s range of motion to be restricted. This results in impairment.² Frozen shoulder, pericapsulitis, scapulo-humeral periarthritis, humero-capular fibrositis, and adhesive capsulitis are a few synonyms for periarthritis shoulder, along with

Corresponding Author: Senthil Kumar. S, Associate Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Science, Chennai, Tamil Nadu, India.

E-Mail: senthilkumar.scpt@saveetha.com
stiff and painful shoulders. Between 2% and 3% of the general population suffer from adhesive shoulder capsulitis, which most frequently develops between the ages of 40-65 years. Diabetics, thyroid issues, previous shoulder injuries, cervical radiculopathy, postoperative immobility, and other conditions are risk factors for frozen shoulder operation. Research indicates that the method began with an irritation of the joint’s inside lining. This region gradually thickens, leading to the shoulder stiffness and pain increasing. This causes the onset of severe shoulder discomfort that prevents successful activity, substantial restrictions of movements, significant night pain, and everyday living to a loss of 50% or more and less than 100% uncomfortable end range of motion.

The traditional methods of treating adhesive capsulitis are exercises, electrotherapy, and massage are just a few of the various modalities that can be used concurrently to treat capsulitis through physical therapy.

Types:

Stage 1: Primary adhesive capsulitis, also known as idiopathic adhesive capsulitis, is an inflammatory condition with no known cause.

Stage 2: Traumatic injuries that cause secondary adhesive capsulitis capsulitis or if another health issue is both present.

Stage 3: Also known as the thawing stage, starts when ROM starts to improve, is characterized by a gradual restoration of shoulder mobility with minimal pain.

A self-administered questionnaire called the Shoulder Pain and Disability Index (SPADI) has two dimensions: one measures pain and the other measures functional ability and activities. There are five questions in the pain dimension about the degree of a person’s agony. Eight questions are used in the functional activity assessment to gauge how difficult a person finds certain functional activities. Various daily tasks involving the use of the upper extremities. For a test, the SPADI takes 5 to 10 minutes. The only trustworthy and valid method that takes time to complete the shoulder measurement for the region. NPRS (Numerical Pain Rating Scale) which can be used in questionnaires. An NPRS is defined as an 11-point scale with scores ranging from 0 to 10, with 0 denoting no pain and 10 denoting the worst possible pain.

The Maitland concept is a method for examining, diagnosing, and treating neuromusculoskeletal disorders with manipulative physical therapy. The cyclical alterations will be made in the joint’s modest spinning, gliding, and other supplementary motions between joints, such as rolling or distracting movements. In order to move around normally, surfaces are necessary. In contrast to grade 3 and 4, grade 1 and 2 of Maitland mobilization techniques are generally utilized to treat joints that are painfully constrained stretching technique. The MET are a subset of soft-tissue or joint mobilizations that were developed to treat the malfunctioning of the muscles and bones. The benefit of MET is that it uses the patient’s energy (in the sort of physical exertion) to produce a therapeutic result.

One of this technique’s primary applications is to restore normal joint range, not expand methods are adaptable and may be used to any disability in any range of motion in joints (ROM) identified through the passive evaluation. There are two basic MET impacts that can be explained in different physiological functions: Post Isometric, Reciprocal inhibition (PRI) and relaxation (RI). According to reports, the cases with chronic adhesive capsulitis react effectively to therapeutic massage using the (MET), resulting in pain reductions and improvements in range of motion. Therefore, efficient therapy that reduces the length of symptoms and incapacity may be of great benefit in terms of decreased morbidity and costs.

This study’s primary objective is to assess the effects of Maitland mobilisation and muscular energy method (MET) in patients with periarthritis shoulder, notably in terms of pain relief and range of motion (ROM) improvement.

Aim

To evaluate the effectiveness of Maitland mobilisation and muscle energy approach in patients with periarthritis shoulders utilising SPADI and NPRS.

Material and Method

The Sri Dhanalakshmi Physiotherapy and Rehabilitation Centre provided a total of 66 subjects
with shoulder periarthritis, aged 35 to 65. In this investigation, convenient sampling with random assignment was used. The entire study process was conducted from November 2022 to April 2023.

**Inclusion Criteria**
- Subjects within the age group of 35-65 years.
- Both genders were included.
- Subjects having stiff painful shoulders for at least 2 months duration.
- Patients who show restriction of movements.
- Patients with diabetes mellitus.
- Diagnosis of stage I and II periarthritis shoulder or frozen shoulder.

**Exclusion Criteria**
- Post fracture complications.
- Presence of any neurological disorders or deficits.
- Uncontrolled diabetes.
- Thoracic outlet syndrome.
- Peripheral nerve injury.
- Concurrent cervical signs and symptoms.
- History of any trauma or surgery.
- Patients with steroid therapy or under the history of multiple steroid injections (> 2 injections).

**Outcome Measures**
- Assessment was performed before starting and after the treatment.
- Shoulder Pain and Disability Index (SPADI).
- Numerical Pain Rating Scale (NPRS).

**Procedure**

Inclusion and exclusion criteria were used to choose the participants. Patients received thorough explanations of the treatment process, and each gave their agreement after being given all the information necessary. According to the assessment form, evaluations of all the included patients were conducted. The patients were split into the “Maitland mobilisation group” and the “Muscle Energy Technique group” at random. Prior to and four weeks following the start of the treatment, assessments were done.

**Maitland Mobilization Group:**

**Treatment Given:**
- Moist pack for 15 minutes.
- Ultrasound - 5 minutes.
- Maitland mobilization: Patients were given Maitland mobilization grade 1 and 2.
- Dose: 2 to 3 glides, 2 sets of 5 repetitions, 3 sessions per week for 4 weeks.
- The patient’s position was in supine lying.

**Flexion Range:**

Procedure: The humerus was glided posteriorly.

**Abduction Range:**

Procedure: The web space of the hand was grasped and the humerus was glided inferiorly.

**External Rotation:**

Procedure: The humerus was glided anteriorly.

**Home Exercise:**
- Active shoulder movements.
- Stretching exercises.
- Codman’s pendular exercise.
- Finger ladder.

**Muscle Energy Technique (MET) group:**

**Treatment Given:**
- Moist pack - 15 minutes.
- Ultrasound - 5 minutes.
- Muscle energy technique (MET): Exercises for Muscle Energy [Post Isometric Relaxation (PIR)] the individual is instructed to attempt a vigorous contraction against resistance at the limit of the range of motion where there will be no joint movement. The individual is then instructed to release the muscle (PIR). 3-4 contraction with 5-7 seconds hold of each contraction for 3 repetitions.
- Dose: 2 sets of 3 repetitions, 3 sessions per week for 4 weeks and with the duration of 8-10 minutes.

**Home Exercises:**
- Active shoulder movements.
- Codman’s pendular exercise.
- Finger ladder.
- Towel exercises.
Data Analysis

Graph- 1: Pre and Post-test values of SPADI of Maitland Mobilization Group

Graph- 2: Pre and Post-test values of NPRS of Maitland Mobilization Group

Graph- 3: Pre and Post-test values of SPADI of Muscle Energy Group

Graph- 4: Pre and Post-test values of NPRS of Muscle Energy Technique Group

Graph- 5: Post-test values of SPADI of both the Groups

Graph-6: Post test values of NPRS of both the Groups

Result

The statistical examination of quantitative data revealed a statistically significant difference between the MET group and the Maitland mobilization group as well as within the group.

Using SPADI, the Maitland mobilization post-test mean was 85.524, whereas the muscle energy group post-test mean was 88.315, with a P value < 0.0001.

Using NPRS, the Maitland mobilization group post-test mean was 4.97, whereas the muscle energy group post-test mean was 6.12, with a P value < 0.0001.

This demonstrates that the Maitland mobilization group received a higher score than the muscle energy technique group. And this study suggests that the Maitland mobilization is considerably more effective than the MET in patients with periarthritis shoulder.
Discussion

This study examined the effects of Maitland mobilization and Muscle energy technique in patients with periarthritis shoulder using SPADI and NPRS. The intervention lasted for four weeks, and the 66 subjects with periarthritis shoulder were divided into two groups (n=33). I have given these techniques along with ultrasound and combined with exercises. There was a greater effect in the Maitland mobilization group than the muscle energy technique group. The P value for both the groups were less than 0.0001, which leads to the conclusion that the Maitland mobilization technique is more effective in reducing pain and increasing the range of motion (ROM) than MET.

An early study by Shikha Tiwari et al., stated that 50 subjects with the age group of 35-70 years, were included in that study. One group received the muscle energy technique whereas the other group received Maitland mobilization. SPADI and ROM were taken as the outcome measure. The study was conducted for 4 weeks. According to the analysis the (p= 0.00), this shows that there is a significant improvement in the Muscle energy technique group than the Maitland mobilization group.\(^1\) Abhay Kumar et al. reported in a previous study that Maitland techniques were beneficial in treating idiopathic shoulder adhesive capsulitis. There were 40 people with idiopathic shoulder adhesive capsulitis, ranging in age from 40 to 60. Exercises under supervision and Maitland’s mobilisation methods were used to treat the one group. The other group received standard therapeutic exercises under supervision. The P value was (p=0.005), indicating that mobilisation in conjunction with a programme of supervised exercise is helpful in lowering pain and enhancing ROM and function.\(^6\) A total of 30 volunteers were chosen and split into two groups of 15 each, according to a previous study by Samiksha Sathe et al. The 15-day study was carried out. The outcome measures used were VAS, NPRS, and ROM. The P value is less than 0.0001 according to the statistical analysis. According to this study, Maitland mobilisation treatment combined with conventional therapy, as opposed to conventional therapy alone, significantly improves ROM and SPADI and decreases pain on the NPRS.\(^2\) A total of 40 subjects, 20 in each group were used in an early investigation by Abdullah Al Shehri et al. One group had Maitland mobilisation coupled with exercises, and another group received ultrasonography along with exercises for a period of four weeks. As a result, the VAS score for the Maitland mobilisation group improved more (4.21 points) than it did for the Ultrasound group (2.5 points). The findings indicate that the Maitland group outperformed the ultrasound group in terms of performance.\(^23\)

Overall, this was an experimental study assessing the effects of Maitland mobilization and MET among periarthritis shoulder patients

Conclusion

This study concludes that Maitland mobilization and Muscle energy technique both are effective in the treatment of periarthritis shoulder. But Maitland mobilization is more effective in improving range of motion (ROM) than the MET. Therefore, MET’s therapeutic use of the antagonists can help when acute or chronic pain makes it difficult to control the contraction of the affected muscles. Maitland mobilization can be used to increase range of motion (ROM) as well as to reduce pain.

Ethical Clearance: The ISRB committee of a private hospital and institution in Chennai has provided its clearance for the conduct of human research that complies with all applicable national laws, institutional regulations. (Application Number-03/ 046/ 2022/ ISRB/ SR/ SCPT).

Funding: Self.

Conflict of Interest: Nil.

References