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Original Research Article

Comparative Analysis of Joint Mobilization and Muscle Energy Technique for Managing Adhesive Capsulitis: A Randomized Controlled Trial

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Conflict of interest: Nil

Abstract:

Background: Adhesive capsulitis, also known as frozen shoulder, is a common shoulder condition characterized by pain, stiffness, and limited range of motion. The shoulder joint's complexity and mobility make it susceptible to various injuries and conditions. Healthcare professionals employ different treatment approaches to manage shoulder joint disorders, including conservative measures such as physical therapy. Joint mobilization and muscle energy technique are two commonly used interventions for adhesive capsulitis.

Methods: This randomized controlled trial aimed to compare the effectiveness of joint mobilization and muscle energy technique in managing adhesive capsulitis. The study included 30 patients with adhesive capsulitis residing in Udaipur. The patients were randomly divided into two groups: Group A (treated with joint mobilization) and Group B (treated with muscle energy technique). Pain levels were assessed using the Visual Analog Scale (VAS), and range of motion (flexion and abduction) was measured. Data were collected at baseline, Day 20, and the 6th week.

Results: The results showed a significant reduction in pain levels and improvement in range of motion for both groups over the six-week period. At the 6th week, a considerable percentage of patients in both groups reported no pain, and there was an increase in the range of motion compared to baseline.

Conclusion: Both joint mobilization and muscle energy technique demonstrated effectiveness in reducing pain and improving range of motion in patients with adhesive capsulitis. These findings suggest the potential benefits of incorporating these techniques into the treatment protocols for frozen shoulder. However, further research with larger-scale studies and long-term follow-up is needed to strengthen these findings and provide evidence-based recommendations for clinical practice.

Keywords: Adhesive Capsulitis, Frozen Shoulder, Joint Mobilization, Muscle Energy Technique.

Introduction

The shoulder joint, also referred to as the glenohumeral joint, is a complex and highly mobile joint responsible for a broad spectrum of upper limb movements. It plays a vital role in everyday activities, sports, and occupational tasks. Formed by the articulation of the humerus and the scapula, the shoulder joint strikes a delicate balance between stability and mobility.[1] Its unique anatomical structure comprises a shallow socket called the glenoid cavity and a sizable humeral head.[2] This arrangement, combined with supporting ligaments, tendons, muscles, and the joint capsule, contributes to the joint's stability. The shoulder joint exhibits an exceptional range of motion, enabling flexion, extension, abduction, adduction, internal and external rotation, as well as circumduction. This versatility allows for a wide array of movements, including reaching, throwing, lifting, and performing overhead actions.[3]

Despite its remarkable mobility, the shoulder joint is prone to various injuries and conditions due to its intricate anatomy and frequent use. Common shoulder conditions encompass rotator cuff tears, shoulder impingement syndrome, shoulder instability, and adhesive capsulitis, commonly known as frozen shoulder. These conditions often manifest as pain, stiffness, limited range of motion, and functional limitations.[4]

The diagnosis and management of shoulder joint disorders necessitate a comprehensive understanding of the joint's anatomy, biomechanics, and underlying pathophysiology. Healthcare professionals, including orthopedic specialists, physical therapists, and sports medicine practitioners, employ diverse assessment techniques, imaging modalities, and treatment approaches to address shoulder joint problems.[5]

Treatment strategies for shoulder joint conditions typically involve conservative measures like physical therapy, non-steroidal anti-inflammatory drugs (NSAIDs), activity modification, and therapeutic exercises. In more severe cases, surgical interventions such as arthroscopic procedures or joint replacement may be necessary to restore function and alleviate pain.[6,7] Notable ligaments of the shoulder joint include the Glenohumeral ligament, coracohumeral ligament, Transverse humeral ligament, and Coraco clavicular ligament.[8] Functioning as a ball and socket synovial joint, the shoulder joint offers a wide range of movements, including extension, flexion, abduction, adduction, internal rotation, external rotation, and circumduction. Blood supply to the shoulder joint is provided by the anterior and posterior circumflex humeral arteries, which are branches stemming from the axillary artery.[9]

Methodology

Research Design: It is a comparative evaluation study.
Population: Patients with adhesive capsulitis.
Sample Size: 30 patients with adhesive capsulitis, residing in Udaipur.
Sampling Method: Random sampling method.
Source of data: Patients coming to Pacific Medical College and Hospital and Pacific College of Physiotherapy with clinical diagnosis of adhesive capsulitis by an orthopaedician and who are fulfilling the inclusion and exclusion criteria.

Inclusion criteria:

- Age = 30-60 years
- Shoulder pain and restricted shoulder movements. Positive special tests

Exclusion criteria:

- Age group = less than 15 years
- Inflammatory conditions
- Subluxated shoulder
- Stroke patients

- Psychological conditions
- Known history of dislocation

Material Used:

- Goniometer
- Chair
- Couch
- Towel

Procedure:

Participants – subjects meeting inclusion criteria are included in the study.

The sample will be initially selected and then randomly divided into two groups of 15 each. Group A was treated with joint mobilization (n=15) and Group B was treated with muscle energy technique (n=15). A consent form will be signed by both groups. Patients were given precautions before the application of techniques Patients were guided not to knowingly attempt to overcome the pain. The patients were then explained about the various kind of pain they might go through during the treatment.

Results

Table 1: Comparison of VAS score between two groups of patients (n=15)

VAS	Day 1	Day 20	6th week	% change at 6th week
Group A				
No pain	0	0	4 (26.6%)	+26.6%
Mild Pain	0	3 (20.0%)	7 (46.7%)	+46.7%
Moderate pain	6 (40.0%)	7 (46.7%)	3 (20.0%)	-20.0%
Severe pain	9 (60.0%)	5 (33.3%)	1 (6.7%)	-53.3%
Group B				
No pain	0	0	7 (46.7%)	+46.7%
Mild Pain	0	4 (26.7%)	7 (46.7%)	+46.7%
Moderate pain	6 (40.0%)	8 (53.3%)	1 (6.7%)	-33.3%
Severe pain	9 (60.0%)	3 (20.0%)	0	-60.0%

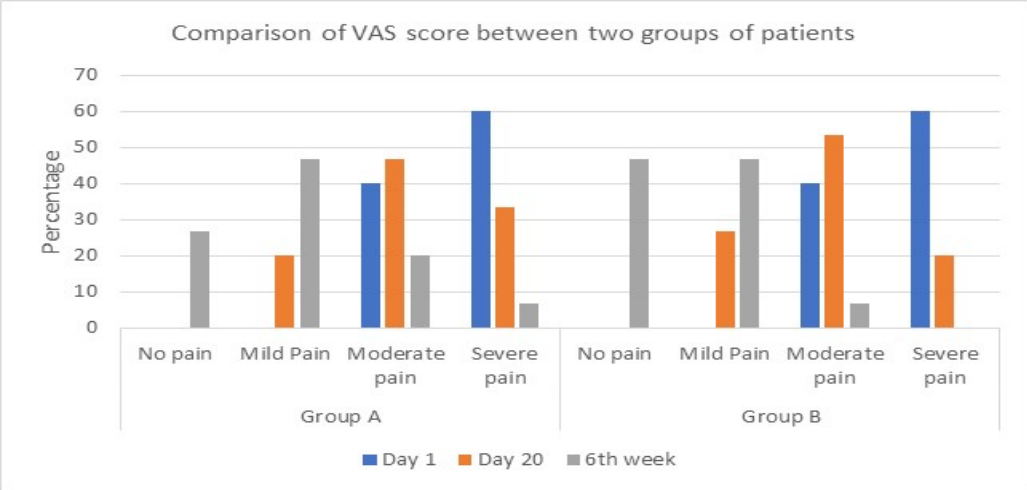

Figure 1: Comparison of VAS score between two group of patients

Table 2: Comparison of Range between two groups of patients (n=15)

Group	Day	Day 1		Day 20		6th Week	
	range	Flexion	Abduction	Flexion	Abduction	Flexion	Abduction
Group A	150-180	0	0	0	0	4 (26.67%)	5 (33.33%)
	90-150	2 (13.33%)	1 (6.67%)	3 (20.00%)	3 (20.00%)	7 (46.67%)	7 (46.67%)
	60-90	7 (46.67%)	8 (53.33%)	8 (53.33%)	7 (46.67%)	3 (20.00%)	2 (13.33%)
	0-60	6 (40.00%)	6 (40.00%)	4 (26.67%)	5 (33.33%)	1 (6.66%)	1 (6.67%)
Group	150-180	0	0	0	0	6 (40.00%)	7 (46.67%)

B	90-150	3 (20.00%)	0	5 (33.33%)	4 (26.67%)	8 (53.33%)	7 (46.67%)
	60-90	6 (40.00%)	8 (53.33%)	7 (46.67%)	8 (53.33%)	1 (6.67%)	1 (6.66%)
	0-60	6 (40.00%)	7 (46.67%)	3 (20.00%)	3 (20.00%)	0	0

Table 2 explains a number of patients having a particular range of flexion and abduction of the shoulder joint.

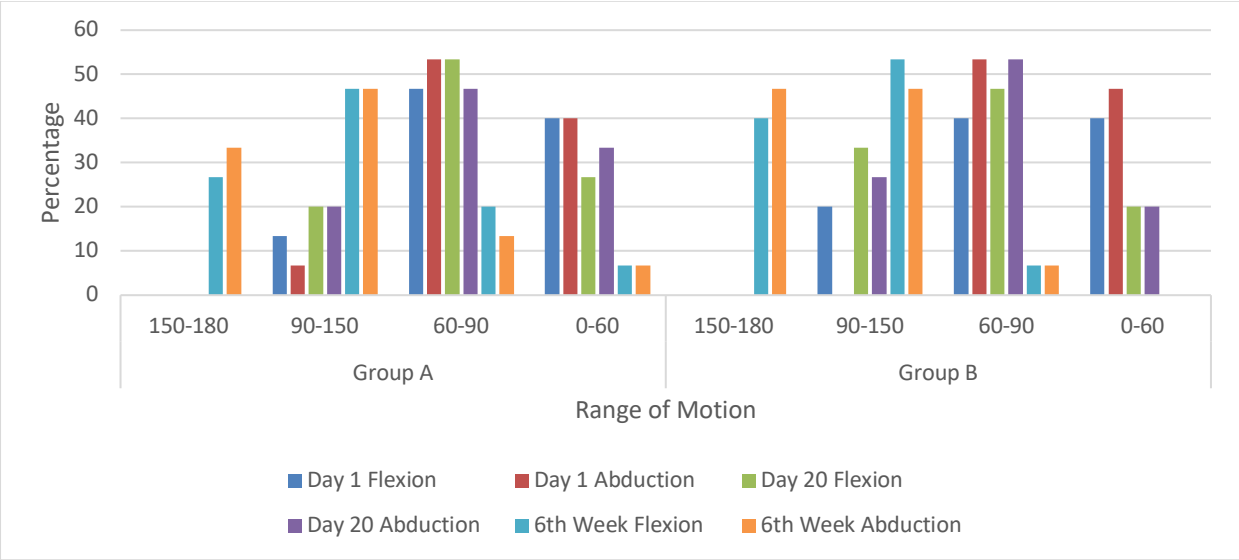

Figure 2: Comparison of Range between two groups of patients

Discussion

In this study, we compared the effectiveness of joint mobilization and muscle energy technique in patients with adhesive capsulitis (frozen shoulder) by analyzing the changes in pain levels and range of motion (flexion and abduction) over a six-week period. The results are presented in Table 1 and Table 2.[10] Table 1 demonstrates the comparison of the Visual Analog Scale (VAS) scores between the two groups (Group A and Group B) at different time points (Day 1, Day 20, and 6th week).[11] The VAS scores represent the intensity of pain experienced by the patients, with lower scores indicating less pain. Additionally, the percentage change at the 6th week compared to Day 1 is provided.[12]

In Group A, at the beginning of the study, the majority of patients experienced moderate to severe pain. However, by the 6th week, there was a significant improvement in pain levels, with a decrease in the percentage of patients experiencing moderate and severe pain.[13] Notably, 46.7% of patients reported no pain at the 6th week, indicating a positive outcome.[14]

In Group B, a similar trend was observed, with a reduction in pain levels from Day 1 to the 6th week. At the 6th week, 46.7% of patients reported no pain, mirroring the results seen in Group A.[15] Overall, both joint mobilization and muscle energy technique demonstrated effectiveness in reducing pain in patients with adhesive capsulitis. The percentage change at the 6th week indicates an improvement in pain levels for both groups, with a substantial reduction in the percentage of patients experiencing moderate and severe pain.[16]

Table 2 provides information on the range of flexion and abduction of the shoulder joint for patients in each group at different time points.[17] The ranges are categorized into four groups: 150-180 degrees, 90-150 degrees, 60-90 degrees, and 0-60 degrees. The number of patients falling within each range is indicated.

In Group A, the majority of patients initially had limited range of motion, with the highest percentage falling within the 60-90 degrees range. However, by the 6th week, there was improvement in the range of motion, as reflected by the increase in the percentage of patients in the higher ranges (150-180 degrees and 90-150 degrees).[18] Similar improvements in range of motion were observed in Group B, with an increase in the percentage of patients falling within the higher ranges at the 6th week. These findings suggest that both joint mobilization and muscle energy technique contribute to improving the range of motion in patients with adhesive capsulitis. The therapy interventions led to a gradual increase in flexion and abduction of the shoulder joint, indicating functional improvement.[19]

Comparing the results of this study with previous research, it is important to note that there is a limited number of studies directly comparing joint mobilization and muscle energy technique for adhesive capsulitis. However, existing studies have highlighted the effectiveness of both techniques in improving pain and range of motion in patients with shoulder joint disorders. Further research and larger-scale studies are warranted to establish a more comprehensive understanding of the comparative efficacy of joint mobilization and muscle energy technique in the management of adhesive capsulitis. Additionally, long-term follow-up and assessment of functional outcomes would provide valuable insights into the sustained benefits of these interventions.[20]

Conclusion

In conclusion, this study demonstrates that both joint mobilization and muscle energy technique contribute to reducing pain and improving range of motion in patients with adhesive capsulitis. These findings suggest the potential benefits of incorporating these techniques into the treatment protocols for patients with frozen shoulder. However, more research is needed to strengthen these findings and provide evidence-based recommendations for clinical practice

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