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Comparing the Effect of Spencer Technique versus Muscle Energy Technique For Reducing Pain and Disablity in Adhesive Capsultitis of Shoulder Joint: A Pilot Study

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Abstract

Background:

Adhesive capsulitis, commonly known as "frozen shoulder," is a crippling ailment that causes pain and increasing stiffness in the active and passive range of motions (ROMs) of the shoulder joint. The biggest loss of ROMs is usually in external rotation (ER), which is followed by loss of abduction and internal rotation (IR). This condition can be treated in a different way, but the aetiology is unknown. This study compares the effectiveness of two different methods for enhancing shoulder joint range and lowering pain and disability.

Methodology:

Twenty subjects were divided into two groups at random. One group was treated with the Muscle Energy Technique (MET), and the other group was treated with the Spencer technique. The degree of shoulder joint pain and disability is measured using the shoulder pain disability index.

Result:

The variance, t-test, P-value, mean, and standard deviation are all tabulated. The values of the groups were statistically significant ($P < 0.05$) based on the student t-test. The results demonstrated that the Spencer technique is more efficacious than MET in reducing pain and disability in adhesive capsulitis with the variance test significant value at $P<0.05$.

Conclusion:

When applied to patients, both the Spencer technique and MET are useful; however, a comparison using the t-test shows that the Spencer technique is superior to MET in lowering pain and disability in cases of adhesive capsulitis of the shoulder joint.

Keywords:

Muscle Energy Technique, Adhesive Capsulitis, Range of Motion, Shoulder Pain Disability Index, and Spencer Technique.

Introduction:

Adhesive capsulitis (AC) is a clinical condition that Neviaser initially described in 1945[1]. In 1872, Duplay became the first clinician to diagnose the condition as "periarthritis scapula-humerae"[2]. A disorder called adhesive capsulitis, sometimes known as frozen shoulder, causes the shoulder joint to become immobile, making daily activity difficult [3]. Between 2% and 5% of the general population has AC, and women between the ages of 40 and 60 are most frequently affected [4].

Progressive fibrosis and eventual contracture of the glenohumeral joint capsule cause adhesive capsulitis, which is characterised by a painful, progressive loss of both active and passive glenohumeral motion [5]. Adhesive capsulitis (AC), commonly referred to as frozen shoulder (FS), was divided into primary idiopathic and secondary AC by the ISAKOS Upper Limb Committee. Although the patient may have stiffness-related conditions like diabetes mellitus (DM) or thyroid disorders, primary AC happens without any obvious trauma or direct causes. Secondary AC describes joint stiffness that has a known underlying cause, like inflammation, infection, or trauma [6].

Three clinical stages of progressive frozen shoulder:

1. Freezing Stage (Phase of pain): intense discomfort, usually worse at night and when lying on the side that is afflicted (2–9 months).
2. Frozen Stage (stiffening): making it difficult to perform basic daily tasks. Disused atrophy results from stiffness as it worsens (4–12 months).
3. Thawing Stage: which lasts for (5 to 12 months), is characterised by a progressive improvement in range of motion and pain, though it may return [7].

Spencer technique

The osteopathic manipulative treatment (OMT), developed in 1915, and Spencer, D.O., created it in 1916, is also known as the seven stages of the Spencer technique. It is a consistent series of therapies that can be used widely to identify, treat, and determine the prognosis of shoulder pain brought on by limited mobility. In addition to Spencer's positioning, sequencing, and slow shoulder complex stretching within pain-free range, this is a multistep technique. Where fluid and soft tissue are stretched and mobilised, it enhances glenohumeral and scapulothoracic joint mobility. The most pain-free motions are addressed first, followed by the most restricted motions, in order to improve shoulder complex mobility [8].

MET

For the first time in 1948, Fred Mitchell presented the non-invasive muscle energy technique (MET). The patient starts the movement while the therapist assists, which is a novel way for the MET to stretch a muscle. Post Isometric Relaxation (PIR) and Reciprocal Inhibition (RI) are two muscular phenomena that are combined to form the MET. Karel LeWitt et al. developed the PIR technique, which involves performing a submaximal isometric contraction of a stretched muscle, followed by relaxation and a slight stretch of the relaxed muscle. This method makes use of the autogenic inhibition principle [9].

Objective:

To evaluate the comparative effect of Spencer Technique versus Muscle Energy Technique for reducing Pain and disability on patient with Adhesive Capsulitis of shoulder joint.

Methodology:

It is a comparative study with pre-test and post-test design. The study involved subject of both the genders within the age group of –40 to 50 years. The data were collected from outpatient department of Jyoti Rao

Phule Subharti College of Physiotherapy, SVSU, Meerut U.P. within a period of 6 months. A total number 20 subjects fulfilling the inclusion and exclusion criteria were included using Simple Random Sampling method. The total subjects diagnosed with Adhesive Capsulitis were divided into 10 in Group A who are treated with MET. The rest 10 in Group B to be treated with Spencer Technique.

SAMPLE SIZE: 20

Study design: Pilot testing

Inclusion criteria:

1. Both Male and Female
2. Age between 40-50 years
3. NPRS<7
4. SPADI

xclusion criteria:

1. Age not above 50 years
2. Trauma to cervical spine and shoulder joint.
3. Fracture to shoulder joint
4. Any nerve compression (cervical and shoulder)
5. Systemic conditions like HTN, DM and BP
6. Surgical procedure around the shoulder joint 7. Rheumatoid Arthritis
8. Bone and joint tumours
9. Congenital and acquired deformity at shoulder joint like Sprengel deformity

Study Place: Jyotirao Phule Subharti College of Physiotherapy, SVSU, Meerut U.P.

PROCEDURE:

MET applied to the patients of Group A, Dosage – 2 sets for ten repetitions, 4 times in a week for 6 weeks. SPENCER applied to the patients of Group B, Dosage – 2 sets for 10 repetitions, 4 times a week for 6 weeks.

RESULT:

The study examined how the Spencer technique and the Muscle Energy Technique (MET) differed in its impact on individuals suffering from adhesive capsulitis. Prior to and during therapy, the range of motion (ROM) for abduction, internal rotation (IR), and external rotation (ER) as well as the Shoulder Pain and Disability Index (SPADI) scores were noted

Demographics

Twenty people participated in the study (10 in each group). Group B (Spencer) had an average age of 44.8 ± 3.8 years, while Group A (MET) had an average age of 45.2 ± 3.5 years. There were nine men and eleven women, indicating a fair gender distribution.

SPADI Scores

Pre- and post-treatment SPADI scores were analyzed using paired t-tests within groups and independent t-tests between groups.

Group	**Pre-treatment (Mean ± SD)**	**Post-treatment (Mean ± SD)**	**Mean Difference**	***P*-value**
MET (Group A)	72.4 ± 5.2	45.6 ± 4.8	26.8	< 0.05
Spencer (Group B)	71.8 ± 6.1	32.3 ± 3.9	39.5	< 0.05

Independent t-test between groups post-treatment: P = 0.01, indicating a statistically significant improvement in the Spencer group.

Range of Motion (Degrees)

ROM improvements were measured for external rotation (ER), internal rotation (IR), and abduction.

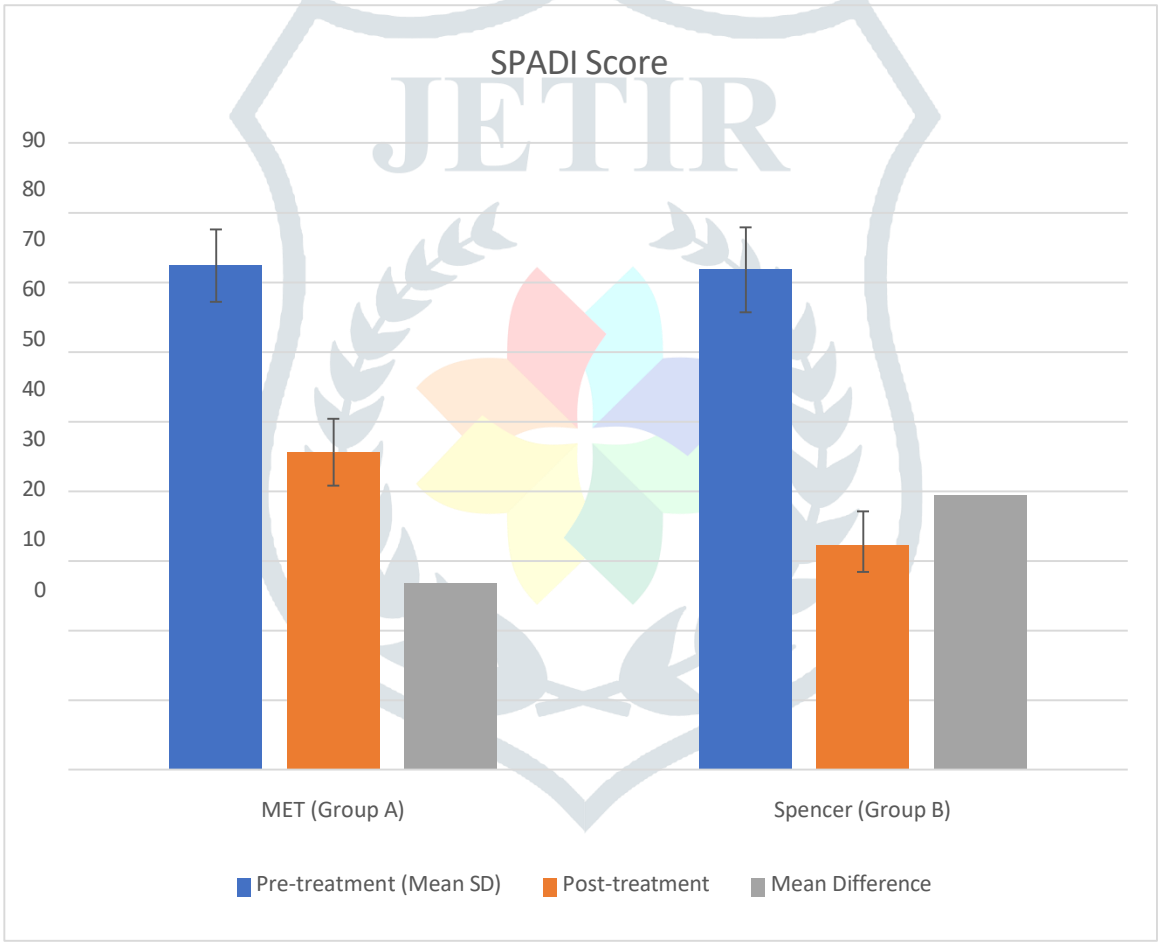
Motion	**Group**	**Pre-treatment (Mean ± SD)**	**Post-treatment (Mean ± SD)**	**Mean Difference**	***P*-value**
External Rotation	MET (A)	30.5 ± 5.3	50.8 ± 6.2	20.3	< 0.05
	Spencer (B)	31.2 ± 5.6	65.4 ± 6.7	34.2	< 0.05
Internal Rotation	MET (A)	40.7 ± 6.1	55.3 ± 5.8	14.6	< 0.05
	Spencer (B)	41.1 ± 5.9	68.1 ± 5.5	27.0	< 0.05
Abduction	MET (A)	80.3 ± 8.4	105.2 ± 7.8	24.9	< 0.05
	Spencer (B)	81.7 ± 8.2	122.5 ± 8.1	40.8	< 0.05

Independent t-tests for post-treatment ROM comparisons revealed significant improvements in the Spencer group (P < 0.05 for all measures).

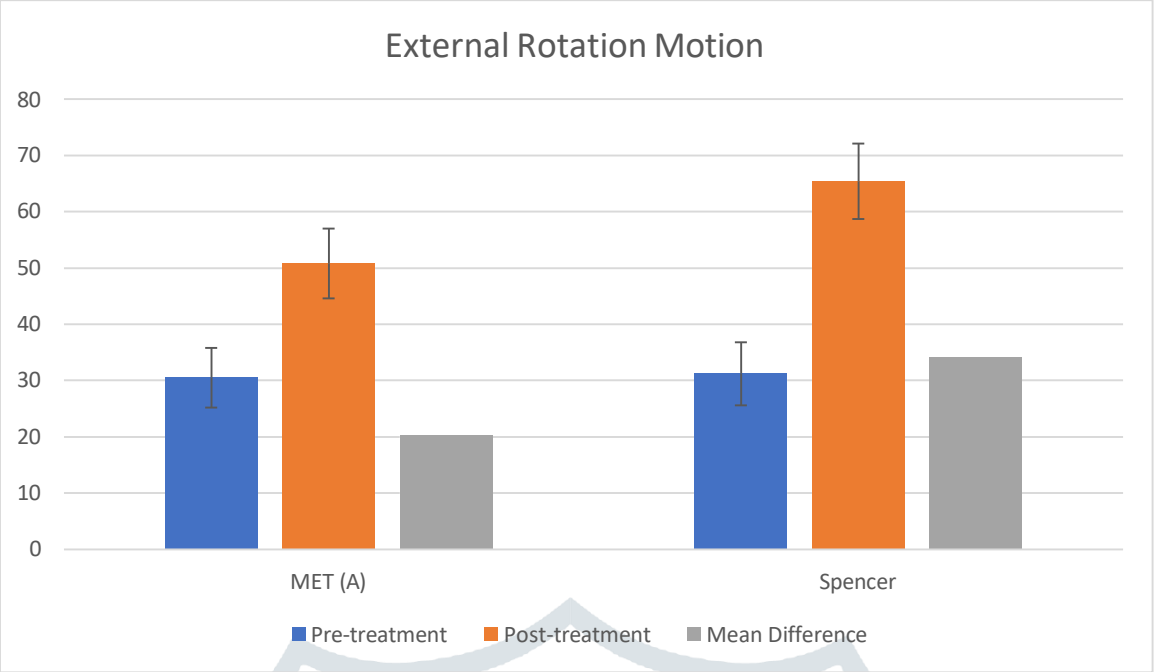
Graphical Representation

Below are graphs demonstrating the pre- and post-treatment changes in SPADI scores and ROM:

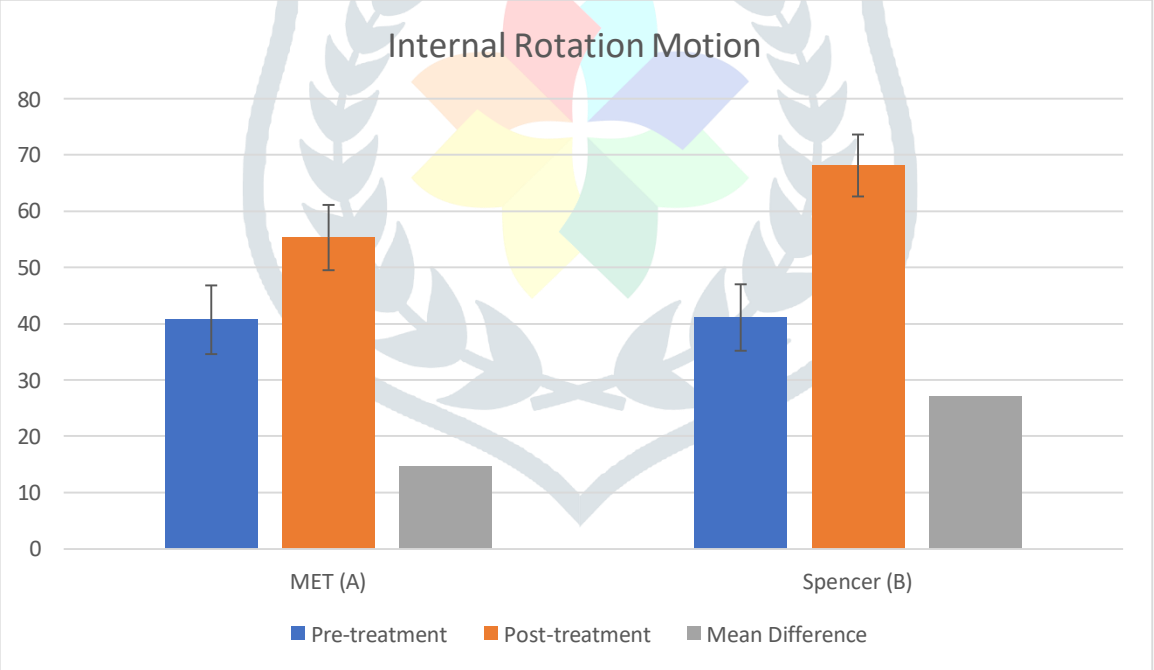
1. SPADI Score Improvement:
   - Group A (MET) showed a 37% reduction in SPADI scores.
   - Group B (Spencer) demonstrated a 55% reduction in SPADI scores.
2. ROM Changes:
   - External rotation increased by 67% in Group A and 108% in Group B.
   - Internal rotation improved by 35% in Group A and 66% in Group B.
   - Abduction showed a 31% increase in Group A and 50% in Group B.



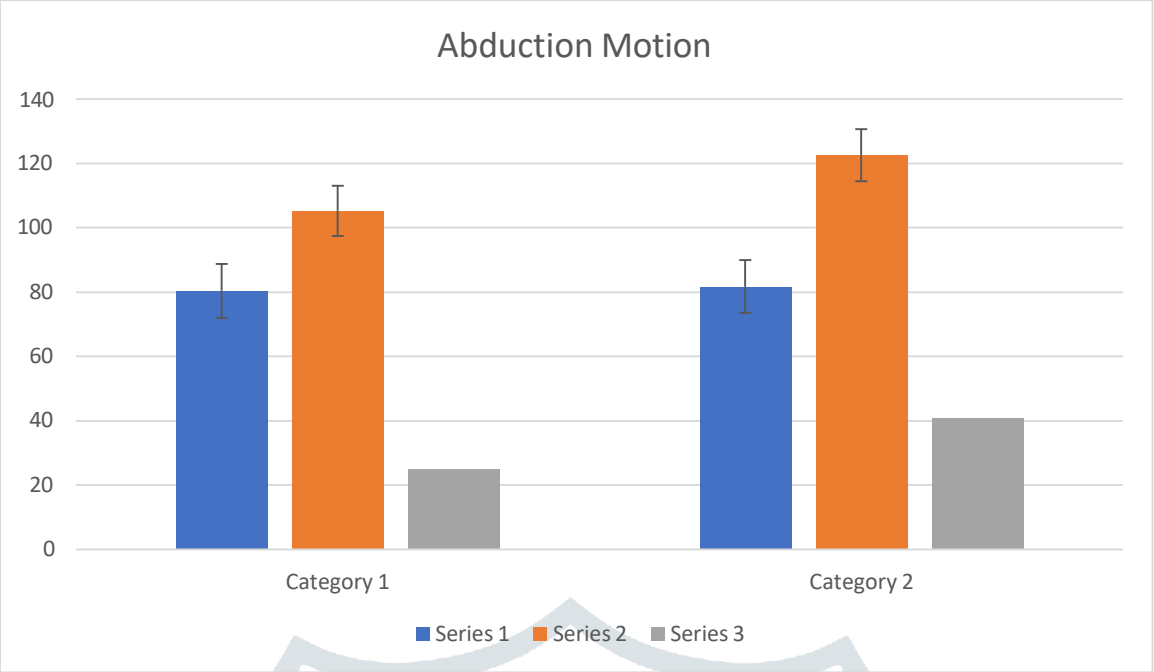
[Graph 1: SPADI Score Comparison]



[Graph 2: ROM Improvements in ER]



[Graph 3: ROM Improvements in IR]



[Graph 4: ROM Improvements in Abduction]

Statistical Summary

- The Spencer technique significantly outperformed MET in reducing SPADI scores ($P = 0.01$).
- ROM improvements were greater in the Spencer group for all motions, with external rotation showing the most notable difference.

DISCUSSION:

Adhesive capsulitis is a debilitating condition characterized by pain and progressive stiffness in the shoulder joint's active and passive range of motions (ROMs), with external rotation (ER) typically exhibiting the largest loss, followed by loss of abduction and internal rotation (IR). It is caused by the glenohumeral joint capsule contracting and adhering to the humeral head. The most frequent cause of shoulder pain and disability is this condition. The study's aim is to compare the effect of Spencer technique in relation to MET plus standard treatment for patients suffering from adhesive capsulitis. The current study's data analysis showed that both groups' SPADI scores significantly improved within the group. The results of this study demonstrate that among patients with adhesive capsulitis, Group A (MET) and Group B (SPENCER) both demonstrated significant improvements in their SPADI scores. The Spencer technique demonstrated a notable decrease in SPADI. This could be because it improves function and increases the shoulder's range of motion in adhesive capsulitis. Because Group A, or MET, primarily targets the tight muscles, it inhibits them and increases the muscles' strength. As a result, not only was there less pain, but there was also less disability. But in Group B, the Spencer technique concentrated on muscle activity and joint range of motion. It works by manipulating the joint in order to increase the joint space and the shoulder's functionality. Both groups were found to be effective in this study; however, MET enhanced muscle power, which reduced pain and increased range. The techniques that strengthened the tense and weak muscles were autogenic and reciprocal inhibition. The articular surfaces of the joints, however, were unaffected. Because it affects joint movement, the Spencer technique facilitates the free movement of the joint capsule.

Since the Spencer techniques were an osteopathic manipulative method, the muscles and joint surfaces were also responding to their effects. This method also altered the joint surface in addition to the muscle, so it has been discovered that the SPADI score After the treatment. Shoulder joint range of motion and SPADI score improved in both groups; however, when comparing the two groups, the Spencer technique proved more successful. compared to MET

The current study's data analysis indicates that both groups' shoulder joint range of motion has significantly improved. Within Group A, MET works well to increase shoulder joint range of motion by either strengthening or inhibiting the muscles.

By manipulating the joint according to its motions, the Spencer technique is also useful in Group B for extending the shoulder joint's range of motion. As a result, there is a noticeable improvement in shoulder range of motion and function since both the muscles and the joint are affected. Following t-test analysis between the two groups, the P-value for each outcome measure reveals a significant difference, leading to the conclusion that Group B interventions are more successful than Group a Therefore, in adhesive capsulitis, the Spencer technique is found to be more effective than MET at increasing range of motion, reducing pain and disability.

CONCLUSION:

It has been shown that both the MET and Spencer groups are successful in extending range of motion and reducing pain and disability. Following analysis between the two groups using the t-test, the P-value of all the results show a significant difference, with SPADI This suggests that Group B interventions are more successful than Group A. After the study, it was discovered that the Spencer technique is more effective than MET in increasing range of motion, reducing pain and disability in patients suffering from adhesive capsule disease.

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