

Effectiveness of Mulligans Mobilization with Movement Technique and Tens on Patients with Adhesive Capsulitis

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Abstract:-

Background: Adhesive capsulitis is a benign self-limiting condition characterized by painful and limited active and passive glenohumeral joint range of motion due to inflammation of capsule and synovium. The shoulder joint fulfills the mobility and stability of the body and is affected by injury, disease, and aging. Frozen shoulder is the term describes the painful loss of shoulder motion. Brain mulligan's concept of mobilization is the manual therapy associated with mobilization with the movement of pain-free accessory mobilization with active and passive physiological movement. Mobilization with movement (MWM) is the concurrent application of sustained accessory mobilization applied by the therapist and an active physiological movement to end range applied by the patient. Passive end range overpressure or stretching is then delivered without pain as a barrier. Mulligan's theory for the effectiveness of mobilization with movement is based on the concept related to 'positional fault' that occurs secondary to injury resulting in symptoms such as pain, stiffness and weakness. The cause of positional faults may be due to changes in the shape of articular surfaces, the thickness of cartilage, the orientation of ligaments and capsules or direction and the pull of muscles and tendons. The aim of this study is to find the effectiveness of mobilization with movement's for increasing joint range of motion enhancing muscle function.

Methodology: Quasi-experimental, pre-test and post-test type study will be conducted among 10 patients with adhesive capsulitis for a 4-week duration.

Outcome Measures: Visual Analogue Scale (VAS) and GONIOMETER.

Result and Conclusion: This study concludes that the mulligans' technique is effective in reducing pain and improving the Range of motion of the shoulder in adhesive capsulitis.

Keywords: Adhesive capsulitis, Visual Analogue Scale, Goniometer, Range of motion

joint in complex joints. The shoulder joint is an important joint. The adhesions are more marked in the axillary fold. Codman introduced the term frozen shoulder in 1934 to describe who had a painful loss of shoulder motion. Brain Mulligan qualified as physiotherapy in 1954 and gained his diploma in manipulative therapy in 1974. He has been the author of numerous articles published in the New Zealand Journal of physiotherapy.

Brain mulligan's concept of mobilization of movement is a natural continuance of progression in the development of manual therapy from active self-stretching exercise to therapist applied passive physiological movement to passive accessory mobilization techniques. Mobilization with movement is the concurrent application of pain free accessory mobilization with active and passive physiological movement. NAGS – Natural Apophyseal Glides,

SNAGS – Sustained Natural Apophyseal Glides,

MWMS – Mobilization with Movements.

The concept of Mobilizations With Movement (MWM) of the extremities and SNAGS of the spine was first coined by Brain R.Mulligan. Mobilization with movement (MWM) is the concurrent application of sustained accessory mobilization applied by a therapist and a physiological movement to end range applied by the patient. Passive end- of range overpressure, or stretching, is then delivered without pain as a barrier. The altered joint mechanics may be due to pain and muscle guarding, joint effusion contractures or adhesions in the joint capsules or supporting ligaments, joint effusion contractures or adhesions in the joint capsules or supporting ligaments, joint motion. Mulligan's theory for the effectiveness of a Mobilization with movement is based on the concept related to a 'positional fault' that occurs secondary to injury and leads to mal tracking of the joint; resulting in symptoms such as pain, stiffness or weakness.

The cause of positional faults has been suggested to be due to changes in the shape of articular surfaces, the thickness of cartilage, orientation of fibers of ligaments and capsules, or the direction and pull of muscles and tendons. Further research has established the effectiveness of Mobilization with movement's for increasing joint range of motion enhancing

I. INTRODUCTION

Adhesive Capsulitis is a benign self-limiting, the condition is characterized by a painful and limited active and passive glenohumeral range of motion. Adhesive capsulitis is inflammation of capsule and synovium. The shoulder is structure and function to fulfill the needs of the human body for both mobility and stability. The complex joints are more likely to be affected by injury disease or aging than the simple

muscle function. The shoulder joint is a ball and socket synovial joint with 3 degrees of freedom. It has a capsule and several associated ligaments and bursae. The articulation is made up of the large head of the humerus and the and the small glenoid fossa. Since the glenoid fossa of the scapula is the proximal segment of the shoulder joint or Gleno Humeral joint, any motions of the scapula may effect shoulder joint function. The shoulder has sacrificed congruency to serve the mobility needs of the hand. The glenohumeral joint describes 3 degrees of freedom. Flexion – extension, Abduction-adduction, medial rotation / lateral rotation. The range of each of these motions occurring safely at the glenohumeral joint varies considerably. The range Medical rotation /lateral rotation of humerus varies with the position with the arm at the side medial and lateral rotation may be limited to as little as 50 degrees of combined motion. The range of motion for flexion and abduction of the glenohumeral joint are reported to be anywhere from 90 degrees to 120 degrees or as much as 135 degrees, active abduction to be limited to 90 degrees when the scapula did not participate in the motion but claimed 120 degrees of motion was available passively. The restriction of glenohumeral joint abduction to 90 degrees of active motion is evident when the scapula is immobilized.

The scapulothoracic joint contributes to both flexion and abduction of the humerus by upwardly rotating the glenoid fossa 60 degrees from its resting position. if the humerus were fixed to the fossa, this alone would result in 60 degrees of elevation of the humerus. The glenohumeral joint contributes 120-degree flexion and anywhere from 90 degrees to 20 degrees of abduction.the maximum range for glenohumeral joint, the ratio may be close to 3 degrees of glenohumeral movement to 2 degrees of scapulothoracic movement. During the initial 60 degree of flexion or initial 30 degree of abduction of the humerus, an inconsistent amount and type of scapular motion takes place relative of glenohumeral motion .the scapular increase in contribution approaching a1:1 ratio with glenohumeral movement .in the later part of range, the glenohumeral joint again increase its contribution, poppen, and walker found the glenohumeral to scapulothoracic ratio to 5:4 between 24 degree and maximum elevation in the plane of the scapula

Adhesive Capsulitis

Adhesive capsulitis is a painful restriction of both active and passive glenohumeral joint motion in all planes or a global loss of glenohumeral joint motion. It occurs in 40-60years. It may be primary with no precipitating event and secondary associated with precipitating illness like shoulder tendinitis, Cardiac surgery, pulmonary problems, diabetes mellitus, thyroid disease.

Clinical features are phase -1 where the painful phases, the Patient describes an insidious onset of predominantly nocturnal pain, as without a precipitating factor. The pain is not related to activity although the furthest ROMcan increases the pain. as the disease progress, the patient has pain even at

rest. Phase 2 is an adhesive phase, the pain from phase 1 can persist, although it may decrease. Progressive limitation in ROM occurs in a capsular pattern (that in all directions). Normally daily activity can be severely affected. Hallmarks of this phase is an inability to move at the great amplitude and an ability to move on the affected side. In phase- 3, the Regression phase pain progressively decreases and Limitation in range of motion progressively increases over 12-24months.

Apley scratch test is the special test used to diagnose adhesive capsulitis. Nonsteroid anti-inflammatory drugs, Corticosteroids and Physiotherapy management are medical management.

Aim of the study to find out the ‘Effectiveness of mulligan’s mobilization with movement and tens on patients in adhesive capsulitis. Objectives of the study: Mulligan’s mobilization with movement technique helps to improve range of motion and to reduce the pain. Need for the study - Shoulder pain with a subsequent limitation of movement is a common problem in both sporting and working population. The mobilization technique improves the range of motion and reduces pain. Mobilization with movement technique improves the range of motion. Physiotherapy techniques such as mobilization with movement are more effective in adhesive capsulitis.

Operational Definition

Adhesive capsulitis is a painful restriction of both active and passive Glenohumeral joint motion in all planes or a global loss of Glenohumeral joint.it occurs in 40-60years.mobilization with movement is the concurrent application of sustained accessory mobilization applied by a therapist and an active physiological movement of end range applied the Patient, passive end of the range overpressure or stretching is then delivered without pain as a barrier. Transcutaneous electrical nerve stimulation tens is the application of the pulse rectangular wave current via surface electrodes on the patient's skin.TENS is a non-invasive technique in which a low –voltage electrical current is delivered through wires from a small power unit to electrodes located on the skin.TENS is often used to treat pain in a variety of acute and chronic musculoskeletal conditions.recent reports, however, suggest that the absorption of calcific deposits in the shoulder muscle tendons is accelerated by low-frequency TENS therapy and may b related to increased microcirculation in the region of the stimulation. Although no controlled studies were identified to document those Hypotheses, the most consistent and extensive pain relief appears to occur with stimulation of the acupuncture points through to be associated with shoulder pain.

II. DESIGN AND METHODOLOGY

The study was quasi-experimental in nature .10 samples were selected from the population using a simple random sampling method. pre-test assessments of pain were taken using a visual analog scale(VAS).

Inclusion Criteria

The subject of the age group of 40-60 years. Both sexes are included. Subacute frozen shoulder is only stretch. Unilateral cases are included. The mobilization period of fracture cases is included. Mobilization period of cases are included

Exclusion Criteria

Patients below 40 years or above 65 years of the age, Diabetic patients, post-traumatic shoulder stiffness, History of fracture of the shoulder complex, Rotator cuff rupture, Peripheral nerve injury/pathology, Post-surgical cases, Unstable shoulder/recent dislocation, Malignancies in around shoulder, Rheumatoid arthritis, osteoporosis

Methodology

10 subjects were selected using a simple convenient sampling method from the population in an around Tirunelveli. All the participants were explained about the purpose and procedure of study and written consent was obtained from them before being included in the study

Procedure

Mulligan's Mobilization With Movement Flexion Patient Position: The patient seated at the edge of the chair, the patient arm should be in external rotation while performing flexion. The therapist position stands at the lateral side of the unaffected shoulder. Then the Therapist stabilize scapula with his one hand thenar eminence of the other hand placed medial to head of the humerus. The therapist glides the humeral head in the posterolateral inferior direction with thenar eminence. Precaution The patient performs offending movement while the glide is sustained, this movement should now become pain-free passive overpressure can be given by the patient at the end of the newly available range using his other hand. The hand of the therapist should also move along with movement in order to sustain the along the treatment plane allows upward rotation of scapula as the patient moves his shoulder.

Patient position: Patient seated at the edge of the chair, the patient arm should be in external rotation while performing abduction. *Therapist position* The therapist stands at the lateral side of the unaffected shoulder. The procedure, The therapist stabilizes scapula with his one hand thenar eminence of the other hand placed medial to head of the humerus. therapist glides the humeral head in posterolateral gliding with

thenar eminence. **PRECAUTION** The therapist moves his hand along with the movement therapist angle of the forearm should be in posterolateral direction mobilizing hand of the therapist should not roll over the acromioclavicular joint. *Patient position* Standing or sitting rest his abducted shoulder and flexed elbow 90 degrees on the therapist's shoulder. *Therapist position* The therapist stands laterally to the affected side. *Procedure* Therapist clasp hands and place them on upper-end patient arm such that little finger of the hand comes distal to the lateral border of the acromion. The therapist glides the head of the humerus inferiorly by pushing it down thumb clasped the hands placed on the upper end of humerus patient perform essentially movements (internal or external movement) and applies passive over force at the end of newly available range. **Precaution** To avoid depression of shoulder girdle therapist should place his hand distal to the lateral end of the acromion therapist should not alter his or her height to avoid change in the abduction of the affected shoulder. Transcutaneous electrical nerve stimulation is the application of a pulsed rectangular wave current via surface electrodes on the patient's skin. Transcutaneous electrical nerve stimulation (TENS) is a non-invasive technique in which a low-voltage electrical current is delivered through wires from a small power unit to electrodes located on the skin. TENS is often used to treat pain in a variety of acute and chronic musculoskeletal conditions. Recent reports, however, suggest that the absorption of calcific deposits in the shoulder muscle tendon is accelerated by low-frequency TENS therapy and may be related to increased microcirculation in the region of the stimulation. Although no controlled studies were identified to document that hypothesis, the most consistent and extensive pain relief appears to occur with stimulation of the acupuncture points through to be associated with shoulder pain. *The Frequency of Pulse shape:* is Rectangular, *Pulse width;* Measure in microseconds and the *Frequency* is about 15 Hz *Intensity* 0 to 60 μ A *Goniometry* is a measurement of angles created at the human joint by the bones of the body. The instrument used for this measurement is known as goniometer. The patient joint is placed in a starting position of zero degrees then permit the patients to move the joint available range of motion and measure the angle. Goniometric measurements are recorded in a numerical table and range of motion measured.

III. DATA ANALYSIS AND INTERPRETATION

TABLE -I
PAIN ASSESSMENT CHART BY USING VISUAL ANALOGUE SCALE

Cases	Pre Treatment	Post Treatment	Intervention changes (%)	TENS and Mobilization with Movement
1.	7	2	57.14	
2.	6	1	83.3	
3.	8	3	62.5	
4.	8	2	75	
5.	7	2	71.4	
6.	6	1	71.4	
7.	5	1	80	
8.	6	1	83.3	
9.	5	1	80	
10.	7	2	71.42	

Means and standard deviation of pre-test and post-test scores of pain recorded in the Visual Analogue Scale.

Variable	Pre Test Score		Post Test Score	
	Mean	SD	Mean	SD
Pain as per VAS	6.5	8.1	1.6	38.44

Chart showing the mean and standard deviation of pre-test and post-test scores of pain recorded in Visual Analogue Scale

GRAPH -I

PAIN ASSESSMENT CHART BY USING VISUAL ANALOGUE SCALE

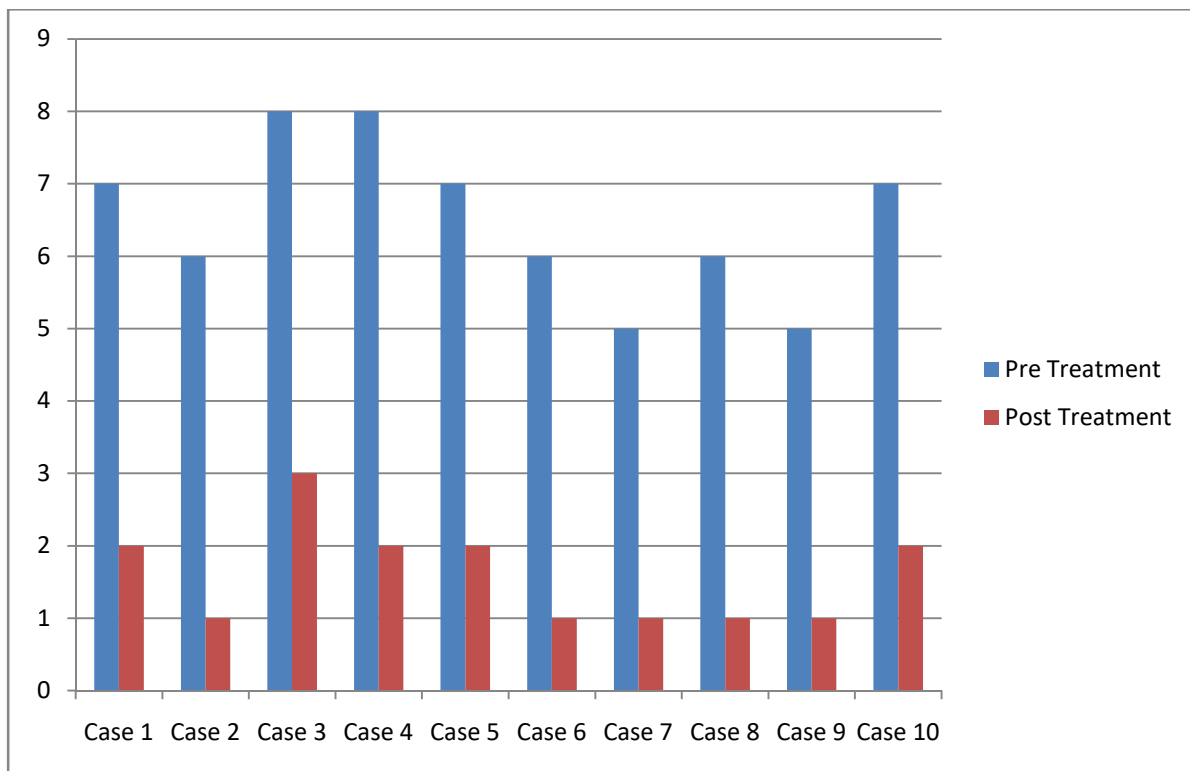
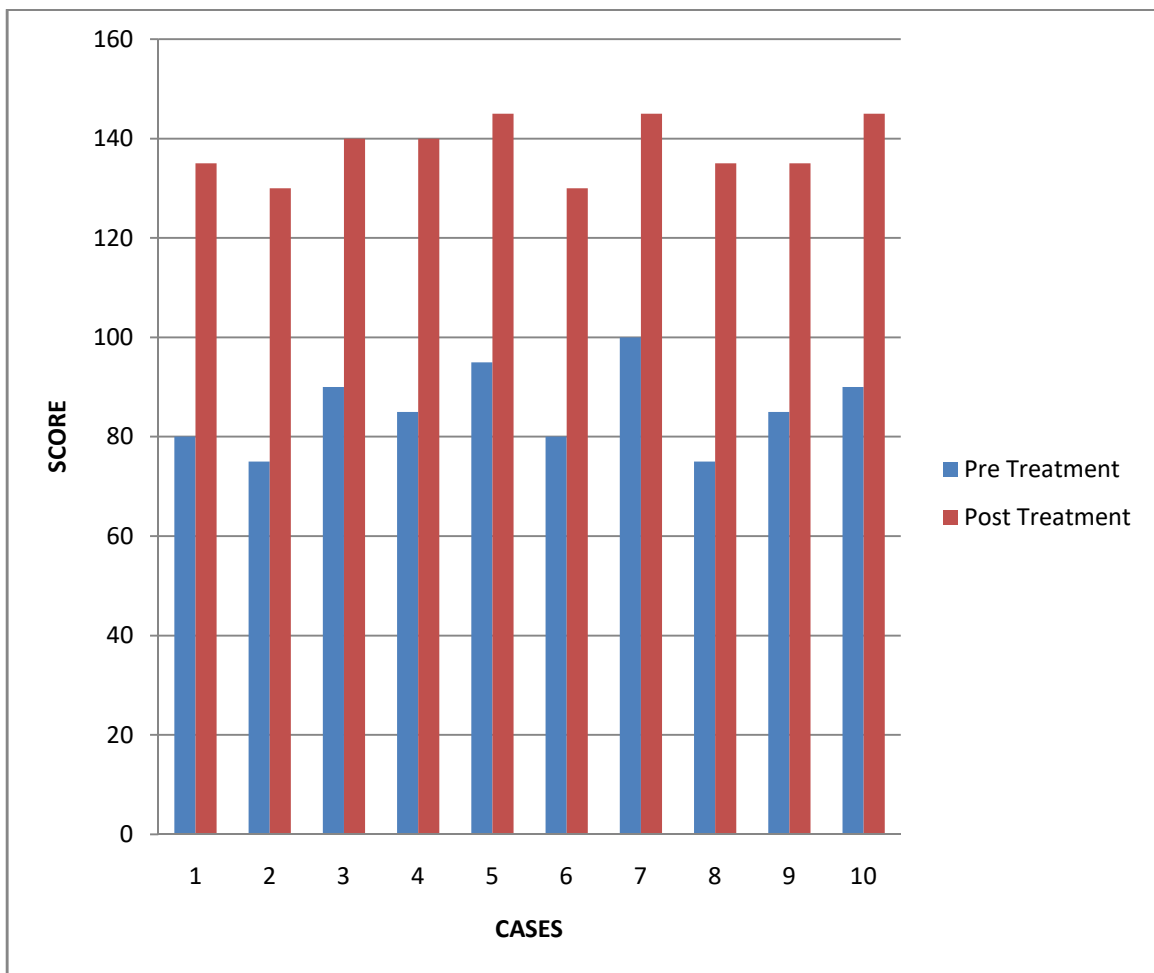


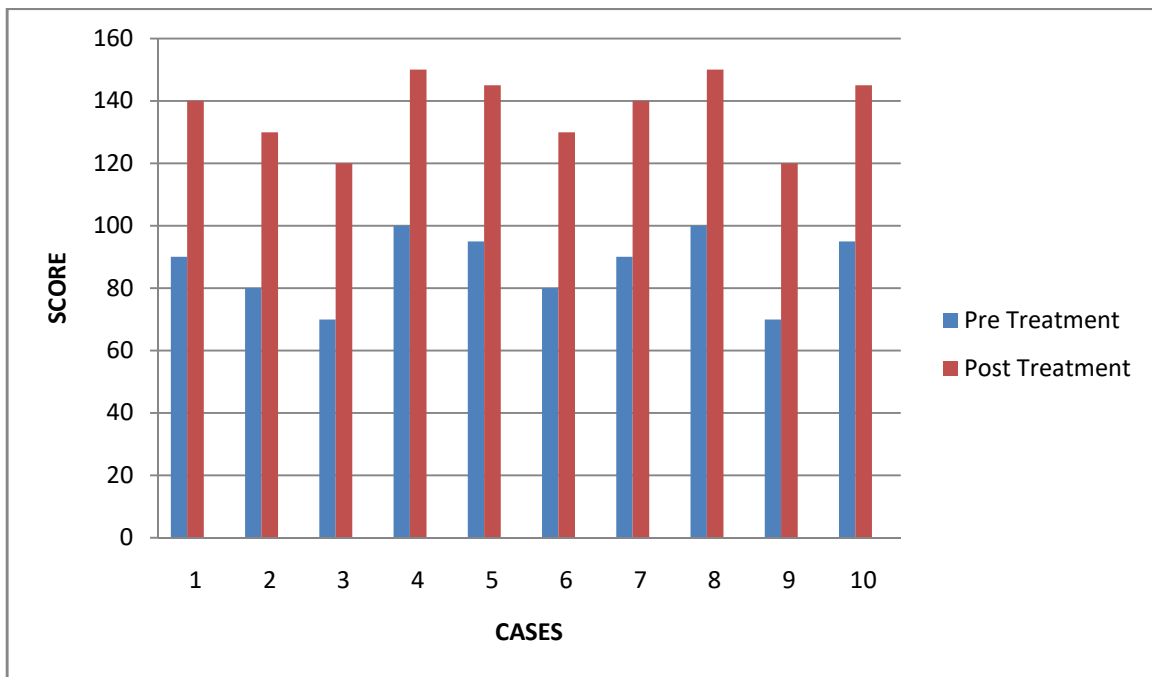
TABLE - II
RANGE OF MOTION ASSESSMENT CHART BY USING GONIOMETER

Case No.	Affected Side	Shoulder Abduction		Shoulder Flexion		Shoulder External Rotation	
		Pre Treatment	Post Treatment	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment
1	Right	80	135	90	140	35	60
2	Left	75	130	80	130	30	55
3	Left	90	140	70	120	40	60
4	Right	85	140	100	150	45	65
5	Left	95	145	95	145	50	70
6	Right	80	130	80	130	30	60
7	Right	100	145	90	140	35	55
8	Left	75	135	100	150	45	60
9	Left	85	135	70	120	50	70
10	Right	90	145	95	145	40	65

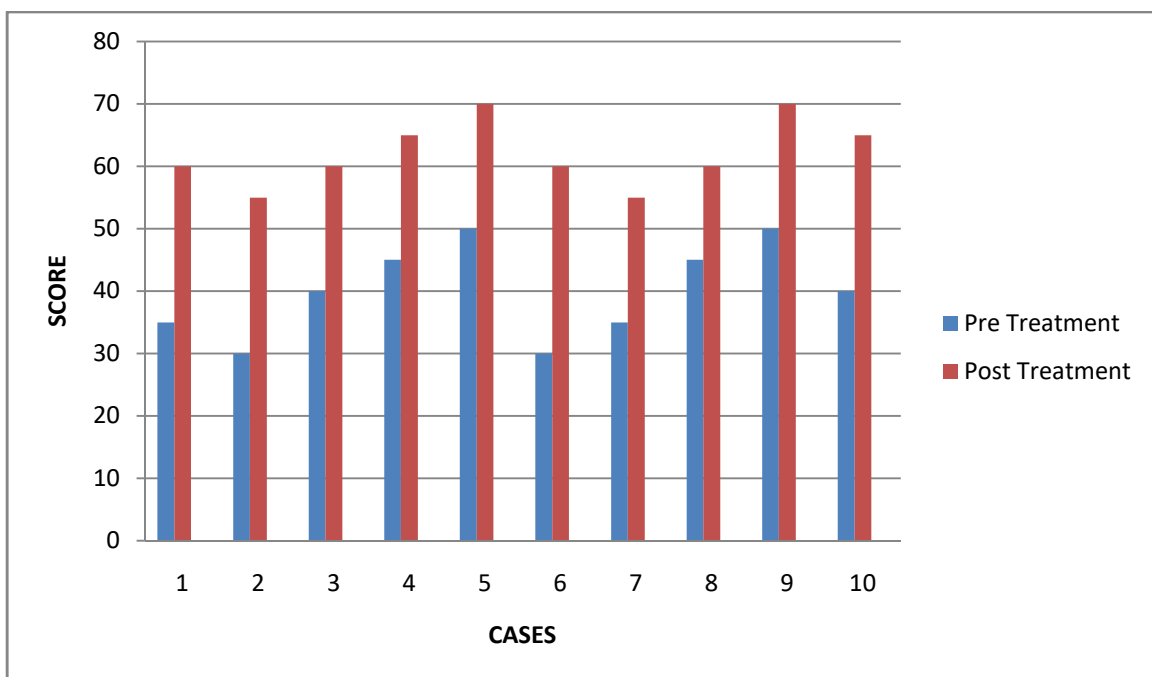
GRAPH - II
SHOULDER ABDUCTION



GRAPH – III
SHOULDER FLEXION



GRAPH – IV
SHOULDER EXTERNAL ROTATION



IV. RESULTS AND DISCUSSION

Table 1 shows the pain scores of the patients as the visual analogue scale both before and after the treatment. It reveals the prognosis of the patient.

Graph 1 shows the pain scores of the patients as per the visual analog scale both before and after the treatment. It reveals the prognosis patient.

Table II shows the shoulder range of motion of the patients as per the goniometer both before and after the treatment. It reveals the prognosis of the patient.

Graph II shows the range of motion of shoulder abduction of the patient before treatment and prognosis of the after treatment.

Graph III shows the range of motion of shoulder flexion of the patient before treatment and prognosis of the after treatment.

Graph IV shows the range of motion of shoulder external rotation of the patient before the treatment and prognosis of the after treatment.

Discussion

This study has been designed to investigate the effectiveness of mobilization techniques for reducing pain and improve the range of motion in adhesive capsulitis. Gravice G. Nicholson concluded that mobilization with movement techniques performed as part of the range helps to reduce pain and increase the range of motion. The results suggest that the intervention of mobilization with movement is effective in adhesive capsulitis.

V. LIMITATIONS OF THE STUDY

Only limited samples are selected for the study. Bilateral adhesive capsulitis cases are not selected. Age above 60 years is not selected.

VI. RECOMMENDATIONS FOR FURTHER STUDY

A similar study can be conducted with an exercise program. A number of samples can be selected for this study. This study can be conducted within a longer duration.

VII. CONCLUSION

The results of this study indicate that mulligan's mobilization with movement technique is used in an effort to reduce pain and improve the range of motion in a patient with adhesive capsulitis of the shoulder. This study concludes that the application of mulligan's mobilization with movement technique is effective in reducing pain and improve the range of motion of the shoulder in adhesive

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