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To Study the Effect of Sleeper's Stretch with Mulligan and Maitland Mobilisations on Pain, Range of Motion and Quality of Life in Subjects with Periarthritis Shoulder

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Abstract: ***Background: The pathological changes in periarthritis shoulder occurs surrounding the intrinsic structure tightness. Sleeper's stretch mainly acts on capsule. There are some studies which supports that Mobilizations is more effective in patients with Periarthritis shoulder. Some studies proven that Sleeper's stretch is more effective in Periarthritis shoulder. As a result, present study is thought to be determine the effects of Sleeper's stretch with Mulligan and Maitland mobilization on Perarthritis shoulder. Objectives: To study the effect of sleeper's stretch with Mulligan mobilization and sleeper's stretch with Maitland mobilization and conventional physiotherapy in subjects with PA shoulder. Methodology: A total of 30 subjects were recruited in the study who met inclusion criteria and informed consent was taken. Initially, baseline values of demographic details like age, VAS, SPADI, ROM was taken. Thirty subjects, were divided into three groups A, B and C with each of ten subjects allocated randomly. Subjects of Group A underwent sleeper's stretch with mulligan mobilization. Subjects of Group B underwent sleeper's stretch with Maitland mobilization. Subjects of Group C underwent wax therapy and conventional physiotherapy. All groups were taken treatment for 6 days in a week for 3 weeks. Sleeper's stretch is given for 10 repetitions and each repetition is for 30 seconds per day. Total session is conducted for 45 minutes per day and subjects were assessed like VAS, SPADI, and ROM after 3 weeks of treatment. Results: The results were analyzed by comparing the pre and post - test values of shoulder abduction, internal rotation, and external rotation range of motion, VAS, SPADI by using statistical analysis. After 3 weeks of treatment abduction, internal rotation, external rotation of shoulder range of motion and SPADI shows high improvement and VAS shows low improvement. Conclusion: Concluded that Mulligan mobilization with sleeper's stretch is more effective i. e., the mean values of ROM for Abduction, internal and external rotation of shoulder, VAS and SPADI has shown the significant improvement in Group - A.***

Keywords: Periarthritis, Maitland mobilization, Mulligan Mobilization, Sleeper's Stretch, Quality of life.

1. Introduction

The shoulder joint is the articulation between the head of humerus and glenoid fossa of the scapula, which includes the structure contributes to the functions of the joint: ligaments, tendons, bursae, bones and muscles.

Periarthritis (**PA**) of shoulderr is characterised by the gradual loss of active and passive shoulder range of motion and spontaneous onset of pain in the shoulder resulting from fibrosis and contracture of joint capsule.

Periarthritis of shoulder is the third most frequent musculoskeletal condition, it affects 10 - 20% of people with diabetes and it affects 2 - 5% of the general population. In 1872, **Duplay** first described frozen shoulder syndrome. In 1934, Codman used the term Frozen shoulder. In 1945, **Nevasiar** coined the term Adhesive capsulitis. It is a condition characterised by substantial restriction of both active and passive shoulder movements by **Zuckerman** and **Cumo**.

There are 3 common stages of periarthritis of shoulder:

1) **Painful stage**: Pain is present in both active and passive motion which, diffuse and may lasts one to two months.
2) **Frozen shoulder**: There will be gradual loss of range of motion which persists from several months to years with minimal pain throughout the range except at end of range of motion.
3) **Thawing stage:** The range of motion improved over the several months to years.

Physiotherapy management of patients with Periarthritis shoulder may vary in many ways from management of patient with other shoulder conditions. Joint mobilisation techniques are assumed to induce various beneficial effects including biomechanical mechanical and neurophysiological effects. Mulligan mobilisation have been proved more beneficial in Perarthritis shoulder. This technique helps to achieve repositioning bone positional faults by enabling physiological movement. Mulligan mobilisation helps in increasing range of motion and to alleviate pain. Maitland mobilisation has also proven to effective in treating Periarthritis shoulder. This joint mobilisation technique follows the Brick wall theory grade 1 and grade 2 helps in

increasing range of motion and to decrease pain. Grade5 helps to break the adhesions and increases the range of motion. Sleeper's stretch helps to decrease capsular tightness in Periarthritis shoulder according to recent research studies. Conventional physiotherapy includes wax therapy and exercises.

2. Materials and Methodology

Type of study: Experimental Study
Study Design: Prospective randomized control design
Sampling Method: Simple Random sampling by lottery method

Inclusion Criteria:
- Age: 40 - 65 YEARS
- Shoulder pain more than 3 months
- Shoulder ROM restriction (Abduction, Internal rotation, External Rotation)
- Gender: Both (Males & Female), Dominant hand (unilateral)

Exclusion Criteria:
- Any neurological deficits like hemiplegia etc.,
- Recent Fractures around shoulder
- Rheumatoid Arthritis
- Steroid injection to shoulder joint
- Any previous upper limb surgery, Cardiac pace maker
- Post Mastectomy shoulder stiffness, Uncooperative patients

A total 30 subjects were included in the study with an age group of 40 to 65 years and they were evaluated and diagnosed as periarthritis of shoulder by orthopaedicians from BIRRD and SVIMS, referred to physiotherapy department.

These 30 subjects, were divided into three groups A, B and C with each of ten subjects allocated randomly. Subjects of Group A underwent sleeper's stretch with mulligan mobilization for six days in a week for 3 weeks. Subjects of Group B underwent sleepers' stretch with Maitland mobilization for 6 days in a week for 3 weeks. Subjects of Group C underwent conventional physiotherapy includes wax therapy and Shoulder ROM exercises for 6 days in a week for 3 weeks.

Each group had been given a total of eighteen sessions of treatment. Pre and post therapeutic VAS, SPADI, ROM are recorded for all the three groups.

The procedure followed for Group A is described below:
For *Group A*:
Mulligan's Mobilization:
Procedure for Mulligan Mobilization:
For Abduction:
Using Mulligan's Belt:

To posteriorly glide the humerus of a large patient, when you are small in stature, is simple when you use a belt. You stand behind the seated patient and place the belt around your hips and the patient's shoulder.

Place a hand on the scapula for fixation and lean back in such a way as to glide the humeral head back obliquely in the treatment plane. Your free hand's fingers would secure the belt and prevent it from slipping. Ensure that the belt does not slightly elevate the humeral head as this will jam the joint and inhibit movement.

For Internal Rotation:

Using Mulligan's Belt:
- Place the belt in the bend of the elbow and have the loop about 6 centimetres from the floor when it lies obliquely behind the patient's back.
- For the right shoulder, place your left forefoot in the loop ensuring that your heel is on the floor. As the belt lies obliquely, when pressure is applied in the bend of the elbow as your foot plantar - flexes.
- That is right on the joint margin, which does not prevent the forearm from flexing up behind the back. Your two overlapping hands are placed in the axilla to stabilise the scapula and they thus act as a greater fulcrum when you use your abdomen to adduct the arm behind the patient's back.

The procedure followed for Group B is described below:

For *Group B*:

Maitland Mobilization:
Procedure for Maitland Mobilization:

Caudal Glide
To increase range of motion into glenohumeral abduction.

Positioning:
1) The patient is supine lying and joint is positioned as closely to full adduction as possible.
2) The therapist can support the patients forearm and hand by positioning them between the therapist's upper arm and trunk.
3) The stabilising hand is positioned in the axilla and the manipulating hand grips the distal humerus.

Procedure:
The stabilising hand holds the scapula in position against the trunk and the manipulating hand glides the humerus caudally as the therapist rotates his or her trunk away from the joint

Dorsal Glide:

Purpose:
1) To increase range of motion into glenohumeral internal rotation
2) To increase range of motion into glenohumeral flexion.

Positioning:
1) The patient is supine with the glenohumeral joint positioned off the edge of the table.
2) The therapist can support the patient's forearm and hand by positioning them between the clinician's upper arm and trunk

3) The manipulating hand is positioned over the neutral surface of the proximal humerus and the guiding hand supports the upper limb from the dorsal side of the distal humerus.

Procedure:
1) The manipulating hand glides the humerus in a dorsal direction.
2) The guiding hand controls the position of humerus.
3) When approximating the restricted range of horizontal adduction, the dorsal glide can be directed through the shaft of the humerus if the shoulder joint can be positioned in at least 90 degrees of horizontal adduction.

Ventral Glide
- To increase range of motion into glenohumeral external rotation.
- To increase range of motion into glenohumeral extension.

Positioning:
1) The patient is prone with the humerus positioned off the edge of the table and a pillow supporting the coracoid process.
2) The therapist is at the patient's side facing the glenohumeral joint
3) The manipulating hand is positioned over the dorsal surface of the proximal humerus.
4) The guiding hand supports the upper limb from the ventral side of the distal humerus.

Procedure:
1) The manipulating hand glides the hummer in a ventral direction.
2) The guiding hand controls the position of the humerus.

Dosage: Grade 2 and 3 Maitland mobilization given: 60 - 120/ day for 6 days in a week for 3 weeks.

Sleeper's Stretch:

Purpose: To **increase range of motion and to decrease capsular tightness.**
Patient should lie on their affected side with their shoulder stacked underneath you. Patient can use a pillow under their head. Bring patient elbow straight out from their shoulder. Patient should bend their arm at the elbow so fingers are pointed toward the ceiling. Patient should use their other hand to push their forearm down toward the floor. Press as far down as you comfortably can. Patient will feel a stretch in the back of theirr shoulder, arm, or upper back. Hold the stretch for 30 seconds.

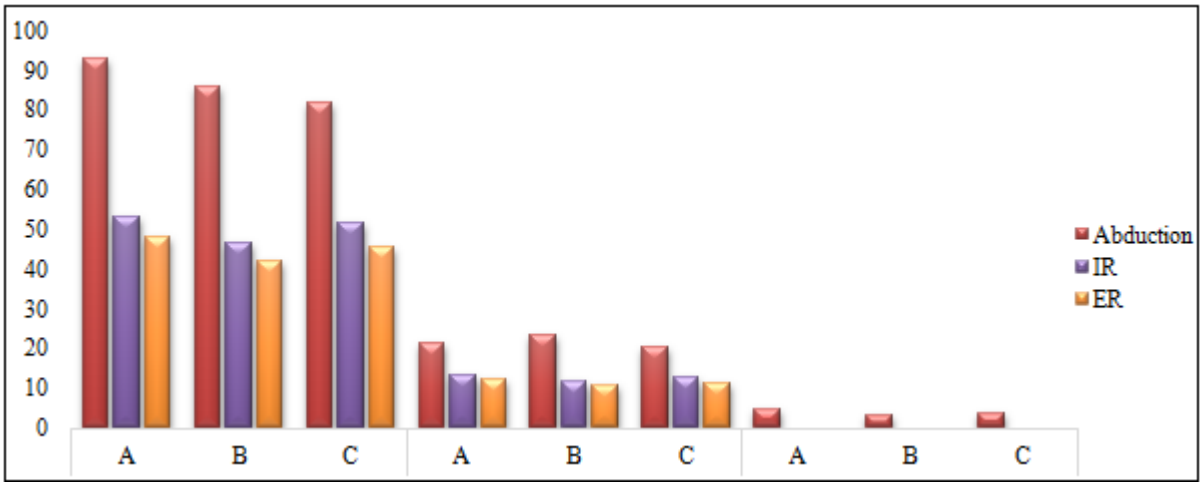
The procedure followed for Group C is described below:

For *Group C*:
Conventional Physiotherapy includes Wax Therapy and Shoulder ROM exercises like, Shoulder flexion, Extension, Abduction, Adduction, Internal rotation, External rotation for 5 times/ 3 sets per day for 12 minutes.

3. Results

Table 1: Comparison of Pre and Post Mean, standard Deviation and F - values of Shoulder ROM for Abduction, Internal rotation, External Rotation among three groups

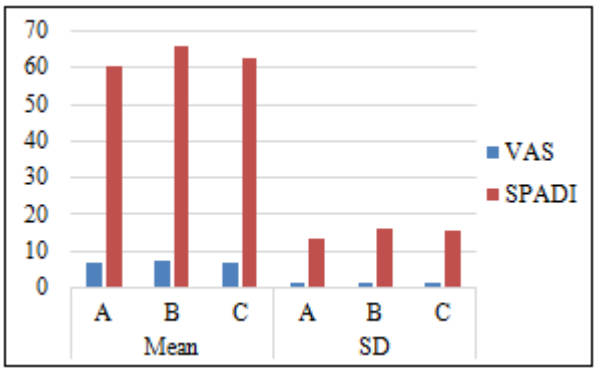
Parameters	Groups	Mean	SD	F - Value	P - Value	Significance at 5% Level
ABDUCTION	A	93.00	21.05	4.61	0.00	Significant
	B	86.00	23.25			Not Significant
	C	82.00	20.50			Not Significant
I. R	A	53.21	13.25	3.92	0.02	Significant
	B	46.53	11.63			Not Significant
	C	41.61	10.75			Not Significant
E. R	A	48.11	12.21	3.52	0.01	Significant
	B	42.05	10.52			Not Significant
	C	40.52	9.24			Not Significant



Graph 1: Comparison of Pre and Post Mean, standard Deviation and F-values of Shoulder ROM for Abduction, Internal rotation, External Rotation among three groups

Table 2: Comparison of Pre and Post Mean, Standard Deviation and F - values of VAS, SPADI among three groups

Parameters	Groups	Mean	SD	F – Value	P – Value	Significance at 5% Level
VAS	A	6.90	1.72	0.531	0.20	Significant
	B	7.50	1.85			Not Significant
	C	7.30	1.82			Not Significant
SPADI	A	60.12	13.81	2.98	0.12	Significant
	B	65.55	16.38			Not Significant
	C	60.31	15.57			Not Significant



Graph 2: Comparison of Mean, SD, and F-values of VAS, SPADI between three groups in pre and post week of treatment

4. Discussion

Mangus et al., stated that joint mobilization controls pain the neuro - physiological effect by stimulating type two mechanoreceptors while inhibiting type - II mechano - receptors, passive joint mobilization provokes golgi tendon activity in the end of the joint mobilization and causes reflex inhibition of the muscle.

Mulligan mobilizations is very effective along with sleeper's stretch in increasing range of motion i. e., abduction, internal rotation and external rotation after three weeks of treatment when compared to Maitland mobilization with sleeper's stretch and Maitland mobilization with sleeper's stretch is effective compared to wax therapy and exercises during the duration of treatment.

Mulligan mobilizations is very effective along with sleeper's stretch in reduction of VAS score and SPADI after three weeks of treatment when compared to Maitland mobilization with sleeper's stretch and Maitland mobilization with sleeper's stretch is effective compared to wax therapy and exercises during the duration of treatment.

Mulligan mobilization - suggested that the application of posterolateral glide to shoulder connect this fault and allows pain free motion to occur Patient mast continue to perform exercises and alter activities of daily living to avoid motion that expose shoulder to re injury.

Maitland's rhythmic oscillations also have an effect on circulatory perfusion. The ongoing circulatory statis may lead to ischemia and the potential for intraneural edema, inflammation, and fibrosis. Mobilization has an effect on fluid flow as blood flow in the vessels supplying the nerve fibers and synovial fluid flow surrounding the avascular articular cartilage. This, by a pressure gradient, is generated which helps in facilitating exchange of fluid, that is, increased venous drainage and dispersing the chemical irritants. This causes a reversal of the ischemia, edema, and inflammation cycle and reduces joint effusion and relieves pain by reducing the pressure over the nerve endings"

The present study is carried to find out the effectiveness of Sleeper's stretch with Mulligan mobilization Vs Maitland mobilization and conventional physiotherapy for Periarthritis shoulder. The subjects included in the study was more than 40 to 65 years and informed consent was taken.

In Table 1: ANOVA was performed, to test the difference between the effectiveness of pre and post Sleeper's stretch with Mulligan, Sleeper's stretch with Maitland and conventional physiotherapy. The results shown that it is statistically significant at 0.05 level. The mean values evidenced that in group A there is an increase in range of motion in Abduction, Internal Rotation and External Rotation i. e., high improvement in group A followed by group B and least in group C.

In Table 2: ANOVA was performed, to test the difference between the effectiveness of pre and post Sleeper's stretch with Mulligan, Sleeper's stretch with Maitland and conventional physiotherapy. The results shown that it is statistically significant at 0.05 level. The mean values evidenced that in group A there is a reduction in VAS and SPADI scores i. e., high improvement in group A followed by group B and least in group C.

5. Conclusion

The present study concluded that Sleeper's stretch with Mulligan mobilisation is more effective than Sleeper's stretch with Maitland mobilization and Conventional physiotherapy after 3 weeks of treatment.

Conflicts of Interest: None

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