



International Journal of Medical and Exercise Science

(Multidisciplinary, Peer Reviewed and Indexed Journal)

ORIGINAL ARTICLE

TO COMPARE THE EFFECTIVENESS OF KALTENBORN MOBILIZATION TECHNIQUE VERSUS MULLIGAN'S MWM IN PATIENTS WITH ADHESIVE CAPSULITIS OF SHOULDER

Search engine:
www.ijmaes.org

C. Deepika Babu¹, M. P. Thenmozhi², D.Kannan Dhasaradharaman³,
R.Ferdinand⁴, S.Kohilavani⁵

Authors:

^{1*}MPT student, JKKMMRF College of Physiotherapy, The Tamilnadu Dr.M.G.R. Medical University Chennai, Tamilnadu, India

^{2,4,5}Professor, JKKMMRF College of Physiotherapy, The Tamilnadu, Dr.M.G.R. Medical University Chennai, Tamilnadu, India

³Professor and Principal, JKKMMRF College of Physiotherapy, The Tamilnadu, Dr.M.G.R. Medical University Chennai, Tamilnadu, India

Corresponding Author:

*¹JKKMMRF College of Physiotherapy, The Tamilnadu, Dr.M.G.R. Medical University Chennai, Tamilnadu, India, Email id: cdeepikababu0107@gmail.com

ABSTRACT

Background: Adhesive capsulitis (AC) is a condition commonly affecting shoulder with 2% of prevalence, causing insidious pain and restriction of active as well as passive gleno-humeral movement. Both male and female populations were affected; however, there is a tendency towards a higher incidence in female patients. Objective of the study is to compare the effectiveness of kaltenborn mobilization technique versus mulligan's MWM in patients with adhesive capsulitis.

Method: 30 patients were selected between the age group of 40 to 60 years and having a past history of adhesive capsulitis for one month. 15 patients were allocated to each group of experiment. Group I was given Kaltenborn mobilization and scapular stabilization exercise and Group II was given Mulligan's mobilization and scapular stabilization exercise. Evaluation of the subjects were done using the visual analogue scale (VAS) and shoulder pain and disability index scale (SPADI). **Result:** Data analysis revealed statistically difference between both groups and proved that kaltenborn mobilization and scapular stabilization exercise is more effective than mulligan mobilization and scapular stabilization exercise in Adhesive capsulitis. **Conclusion:** This study shows that kaltenborn mobilization and scapular stabilization exercise possess a greater effective over mulligan's mobilization and scapular stabilization exercise in treating patients with adhesive capsulitis.

Keywords: Adhesive capsulitis, Kaltenborn mobilization, Mulligan's mobilization, Visual analogue scale (VAS), Shoulder pain and disability index scale (SPADI).

Received on 2nd May 2024; Revised on 22nd May 2024; Accepted on 25th May 2024

DOI:10.36678/IJMAES.2024.V10I02.001

INTRODUCTION

Adhesive capsulitis is a condition characterized by significant restriction of active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder. The etiology and pathology of adhesive capsulitis remains unknown (vermueulenet.al.,2000)¹.

But more recent evidence states that adhesive capsulitis is a complex condition caused of inflammation of synovium and fibrosis in capsule which result in thickening of the inferior capsule lead to contracture. It has been termed “adhesive capsulitis” because of the changes in soft tissues and structure surrounding joint, such as the posterior-inferior joint pouch, the sub-scapularis bursa and the synovial sheath of the long head of biceps (Robert 1965)².The gradual loss of external and internal rotation movement of glenohumeral joint is the single most important factor in differential diagnosis (Ruiz 2009)³.

Adhesive capsulitis usually affects about 1to 50 adults in some stage. The exact incidence and prevalence of it’s not known, commonly seen in the age group of 40 to 60 years.The prevalence of adhesive capsulitis in adults of working age (25-64 yr) was found to be 8.25% in men and 10.15% in women (lundberg 1969)⁴. Even though adhesive capsulitis is believed to be a self limiting proces.s ; it can be severely disabling for months to years and as a result , require appropriate treatment once the diagnosis is made⁵

Many authorities have been proposed this term including: Frozen shoulder, periartthritis and pericapsulitis.

Diabetes mellitus (DM) is a metabolic, disorder characterized by high blood glucose levels over

a period of time leading to various complications. Prevalence of adhesive capsulitis in diabetes mellitus patients is 13.4%^{6,7}.

The kaltenborn technique in which we place the inferior angle of the scapula in the web of the hand and over ride the scapula on the dorsal surface of the hand to stretch the structures which originate from the spine and attach on the inferior angle and medial border of the scapula⁸.It includes various grade of mobilization such as mid range and end range mobilizations are suggested by maitland and kaltenborn to improve joint mobility and reduce pain(Smith edt al., 2003 ;Asher 2000 ; Neviaser)⁹.

Mulligan’s MWM is a mobilization technique that used in the management of musculoskeletal disorders. It includes the manual approach form of sustained glide by therapist to joint while concurrent movement the joint is actively performed by the patient¹⁰.

METHODS

The study was conducted at outpatient department in JKKMMRF College of physiotherapy under supervision of concerned authority. A sample of 30 participants within the age group of 40 to 60 years with adhesive capsulitis was randomly divided into 2 Groups after a due consideration of inclusion and exclusion criteria. Group A and Group B with 15 participants in each group.Group A: received Kaltenborn mobilization and scapular stabilization exercises, Group B: received Mulligan mobilization and scapular stabilization exercises

Total duration of 4 weeks, 3 times with 30 seconds hold time for 1st week, in alternative days/week. Incremented to 5 times in each

week. Hence 20 times with 30 seconds hold at 4th week.

The parameters used for this study was visual analogue scale and shoulder pain and disability index scale. Both male and female were included in this study.

Selection criteria:

Inclusion criteria

- Patient with 4-5 months duration of adhesive capsulitis
- Idiopathic adhesive capsulitis (insidious onset)
- Sex both sexes
- Age group 40 – 60years
- Pain with restricted range of motion not more than 50%
- Unilateral condition
- Restricted range of motion due to capsular lesion.

Exclusion criteria

- Polyarthritis
- Hemiplegic shoulder
- Cardiovascular disease
- Osteoporosis
- Cervical spondylosis
- Hypertension
- Brachial neuralgia
- Neurological disorder (like stroke, Parkinsonism)
- Subscapularis flexibility deficits.
- Fracture / dislocation
- Severe shoulder deformity

Procedure

GROUP-Kaltenborn mobilization and scapular stabilization exercises

Kaltenborn mobilization: Stretch mobilization technique were used, which can be characterized as low rate, low amplitude technique with loading of restricting tissues at the end range of abduction and / or external rotation with a uniform, gliding movement. Kaltenborn mobilization was applied for 3 session per week for 4 weeks.

1. Anterior glide, 2. Posterior glide, 3. Caudal glide

Group-B mulligan's mobilization and scapular stabilization exercise

Mulligan Mobilization

Mulligan technique (MWM) is the concurrent application of sustained application of manual gliding force of joint, with the aim of repositioning bone positional faults while enabling concurrent physiological (osteokinematic) motion of the joint.

1. Shoulder flexion
2. Shoulder abduction

Scapular stabilization exercise

Scapular stabilization exercise can be applied for patients with limited shoulder joint mobility. The exercise improves scapular elevation, protraction, depression, and retraction.

- Duration- 30 minutes
Repetition- 10 repetitions

- Scapula clock exercise
- Towel slide exercise
- Ball stabilization exercise
- Lawnmower exercise
- Serrated anterior punch

RESULTS AND TABLES

Comparison of visual analogue scale measurement between group A and group B

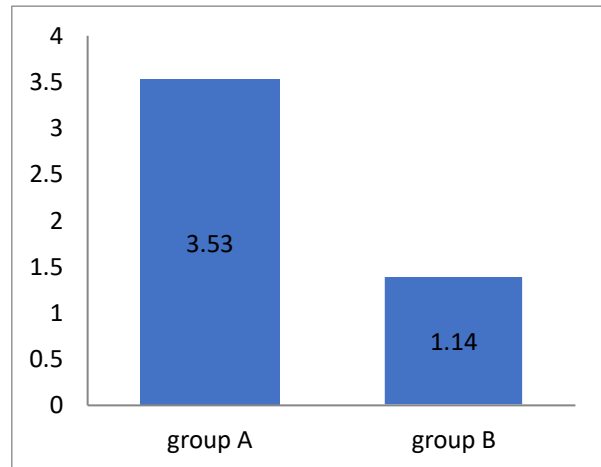
The comparative mean values, mean difference, standard deviation, and unpaired ‘t’ value between group A and group B on visual analogue scale.

Sl.no	VAS	Mean	Mean difference	Standard deviation	Unpaired “t” value
1	Group A	3.53	1.83	1.14	4.3
2	Group B	1.14			

The above table shows the analysis of group A and group B with visual analogue scale. The unpaired ‘t’ value of 4.3 was greater than the tabulated ‘t’ value of 2.05 at 0.05 level of significance which showed that there was statistically significant difference between group A and group B.

The mean value of group A was 3.53, and the mean value of group B was 1.14 which showed that there was a greater improvement in group "A" than group "B".

Mean difference



Comparison of shoulder pain and disability index measurement group A and group B

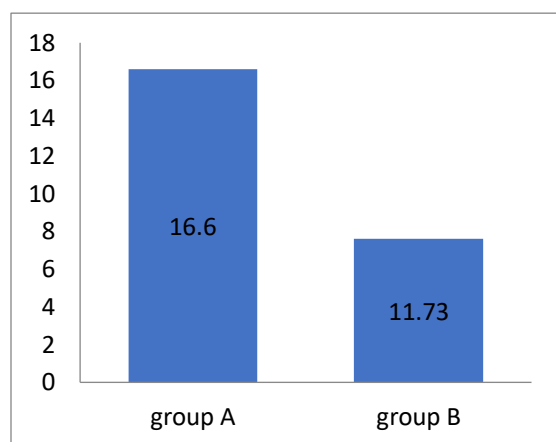
The comparative mean values, mean difference, standard deviation, and unpaired ‘t’ value between group A and group B on Shoulder pain and disability index.

Sl.no	SPADI	Mean	Mean difference	Standard deviation	Unpaired “t” value
1	Group A	16.60	4.87	4.2	3.15
2	Group B	11.73			

The above table shows the analysis of group A and group B with shoulder pain and disability index. The unpaired ‘t’ value of 3.15 was greater than the tabulated ‘t’ value of 2.05 at 0.05 level of significance which showed that there was statistically significant difference between group A and group B.

The mean value of group A was 16.60, and the mean value of group B was 11.73 which showed that there was a greater improvement in group "A" than group "B".

Mean difference



DISCUSSION

The aim of this study was to compare the effectiveness of kaltenborn mobilization technique versus mulligan's MWM in patients with adhesive capsulitis. The patients were treated for 3 session per week for 4 weeks and change pain (VAS) ,and shoulder pain disability were recorded before and after the intervention. The study sample comprised of 30 patients of age group 40 to 60 years grouped as A and B. Group A was kaltenborn mobilization and scapular stabilization exercise where as Group B was mulligan's mobilization and scapular stabilization exercise. The result of statistical analysis brings out the following for consideration.

Kaltenborn mobilization to higher improvement in group A. According to Kaltenborn, stretching of shorten connective tissue & maintain mobility. Delays progressive stiffness & loss of ROM in chronic musculoskeletal disorders including AC¹¹. Mulligan's mobilization technique applied group B. Utilized a posterior directed glide, which hence leads us to increasing flexion and abduction ROM. The study showed greater improvement Kaltenborn mobilization than MWM technique¹².

The result showed that there was statistical significant difference between group A and group B.

In the analysis and interpretation of Visual Analogue scale (VAS) in Group A and Group B for 15 patients in each group

The unpaired 't' value of 4.3 was greater than the tabulated 't' value of 2.05 at 0.05 level of significance which showed that there was statistically significant difference between group A and group B.

In the analysis and interpretation of Shoulder Pain Disability Index scale (SPADI) in Group A and B for 15 patients in each group

The unpaired 't' value of 3.15 was greater than the tabulated 't' value of 2.05 at 0.05 level of significance which showed that there was statistically significant difference between group A and group B.

The result showed that subjects who participated in group A showed greater improvement than the group B. This study concluded that the kaltenborn mobilization was more effective than mulligan's mobilization.

Ethical clearance: Ethical clearance was obtained from the Institutional ethical committee, JKKMMRF. College of Physiotherapy, Komarapalayam with reference No. IRB/MPT/O-502/24, dated 03/03/2023.

Conflicts of Interest: There is no conflict of interest to conduct and publication of this study.

Fund for the study: This was a self funded study.

CONCLUSION

Based on statistical analysis, the result of this study showed that there was significant improvement in both groups. The result showed that subjects who participated in group A showed greater improvement than the group B.

This study concluded that the kaltenborn mobilization was more effective than mulligan's mobilization.

Acknowledgement: We are thankful to all the candidates who were given more support and engaged in this study.

REFERENCE

1. Vermeulen HM, Obermann WR, Burger BJ, Kok GJ, Rozing PM, van den Ende CHM. End- range mobilization techniques in AC of the shoulder joint: a multiple -subject case report. *PhysTher American Physical Therapy Association*; 2000;80(12):1204-13.
2. Robert L. Samilson.1995. Shoulder pain: Diagnosis and treatment of injuries to soft tissues. California Medical Association. Jan; 102, 1:23-25.
3. Ruiz J.2009. Positional Stretching of the Coracohumeral Ligament on a patient with Adhesive Case Report, *The Journal of Manual & Manipulative Therapy*; 17 (1): 58-63.
4. Lundberg B.J.1969. The Frozen Shoulder. *ActaOrthopScand*; 119, 1-59.
5. Robert L. Samilson.1995. Shoulder pain: Diagnosis and treatment of injuries to soft tissues. California Medical Association. Jan;102, 1:23-25.
6. Balci N, Balci MK, Tuzuner S. Shoulder AC and Shoulder Range of Motion in Type II D Diabetes Mellitus. *J Diabetes Complications*. 1999; 13(99) : 135-40.
7. Simth L.L., Burnet S.P., Mc Neil J.D. 2003. Musculoskeletal Manifestations of Diabetes mellitus. *Br J Sport Med*; 37:30-35.
8. Freddy M.Kaltenborn. Manual Mobilization of the joint the kaltenborn Method of Joints Eaxmination and Treatment Volume I the Extremities. 6th Editio.Norli Oslo, Norway; 2006.
9. Neviasser AS, Hannafin JA (2010) Adhesive capsulitis: a review of current treatment. *Am J Sports Med* 38(11) : 2346-2356
10. Mulligan BR. *Manual Therapy: "nag", "snags", mwms"* Etc. edn 6th. Plane View Services Wellington; 2010.
11. Freddy M.Kaltenborn. Manual Mobilization of the joint The kaltenborn Method of Joints Eaxmination and Treatment Volume I The Extremities. 6th Editio.Norli Oslo, Norway; 2006.
12. Ludewig P M, Cook T M. Alterations in shoulder kinematics and Associated Muscle Activity in People with Symptoms of Shoulder Impingement. *PhysTher APTA*. 2000; 80(3):276-91.

Citation:

C. Deepika Babu¹, M. P. Thenmozhi², D.Kannan Dhasaradharaman³ et.al. (2024). To compare the effectiveness of Kaltenborn Mobilization technique versus Mulligan' s MWM in patients with adhesive capsulitis of shoulder , *ijmaes*; 10(2); 1791-1796