

A comparative study between the effectiveness of Mobilization with Movement (MWM) with conventional physiotherapy treatment and conventional physiotherapy treatment alone in patients with adhesive capsulitis of shoulder joint

Mst Rabea Begum

Abstract

Objectives:

To compare between the effectiveness of Mobilization with Movement (MWM) with conventional physiotherapy treatment and conventional physiotherapy treatment alone in patients with adhesive capsulitis of shoulder joint. To enhance evidence based practice in the area of adhesive capsulitis in shoulder joint. To measure pain level in patients with adhesive capsulitis in shoulder joint before and after conventional physiotherapy treatment with Mobilization with Movement (MWM) and conventional physiotherapy treatment alone. To measure range of motion (ROM) of shoulder joint in patient with adhesive capsulitis with or without application of Mobilization with Movement (MWM). To formulate recommendation about effectiveness of Mobilization with Movement (MWM) in patient with adhesive capsulitis of shoulder joint. **Method:** A quasi experimental design was used in this study. The data was collected by using convenient sampling procedure. The samples were randomly assigned to each of two groups. Researcher used 20 participants for this study. Measurement was collected by using Visual Analogue Scale, Goniometer and data was analyzed by unrelated 't' test. **Study area:** The study was conducted in Musculoskeletal unit, Physiotherapy Department, CRP, Savar, Dhaka. **Result:** Unrelated 't' test proved statistically significant for increase lateral rotation ($P < 0.01$), abduction ($P < 0.0005$), medial rotation ($P > 0.025$), shoulder pain intensity on wearing dress ($P < 0.0005$) and shoulder pain intensity on cooking affect ($P < 0.0005$) among ten variables in patient with adhesive capsulitis. **Conclusion;** This study represent that conventional physiotherapy treatment with Mobilization with Movement (MWM) was more effective than conventional physiotherapy in patients with adhesive capsulitis for improvement of ROM (lateral rotation, abduction & medial rotation) and also experimental group was more effective than control group for reduction of pain during wearing dress and cooking affect which support the hypothesis significantly.

Key words: Adhesive capsulitis, Mobilization with Movement (MWM), conventional physiotherapy treatment.

Pediatric Unit, Department of Physiotherapy, CRP, Savar, Dhaka-1343.
Correspondence: physio_miilee@yahoo.com
Cell: +8801675793257

Introduction:

Bangladesh, with 133 million people is an improvised country in South Asia. It embodies all of the above characteristics and difficulties of a developing country. 80% people in Bangladesh live in rural area. Health care system is not available in all levels in Bangladesh and referral system is not well defined. Physiotherapy is a new and independent medical profession in Bangladesh. Physiotherapists are expert in treating different musculoskeletal, neurological, pediatric, geriatric and other medical and surgical condition.

Shoulder disorders are associated with pain, restrict range of motion and disability, which in some cases may last for several years. Most shoulder problems fall into three major categories; soft tissue disorders, articular injury or instability and arthritis. It has been estimated that upto 90% of lesions causing painful shoulder result from extra capsular soft tissue lesions (Dinnes, et al, 2003). Many patients suffer from adhesive capsulitis. This is a rather unusual problem that occurs in the shoulder and results in stiffness, loss of function (Ferry, 2003).

In 2006, Dey said that adhesive capsulitis may be defined as soft tissue lesion of the articular capsule of the shoulder accompanied by varying degree of pain and restricted active and passive movements of the

glenohumeral joint. It is more common in females than males and often presents in the fifth to seventh decade. Adhesive capsulitis is caused by inflammation of the joint capsule and synovium that eventually results in the formation of capsular contractures. The capsule does not become adhered to the humerus, as the term adhesive implies, but the contracted capsule holds the humeral head tightly against the glenoid fossa. Clinically, there is global loss of both passive and active ROM of the glenohumeral joint with external rotation usually being the most restricted physiologic movement (Andrea, et.al, 2007).

Adhesive capsulitis affects about 20% of people with diabetes, compared with 5% of people without diabetes (Diabetes Forecast, 2002) 95% of people with frozen shoulder are completely cured. Full recovery may take several months (Wilson, 2006). A number of patients permanently loss full range of motion and become disabling (Inverarity, 2007).

The disease manifests itself as inflammation of the synovial surface of the joint capsule, the capsular ligaments the periarticular tendons and bursa. Histological the capsule and the synovium are thickening. The condition is clinically characterized by painful restriction of motion of the shoulder joint (Yilmaz, et.al, 2007).

On examination forward flexion may be less than 90 degree, abduction less than 45 degree, internal and external rotation may be reduced to 20 degree or less (Chirra, 2006).

Management of this disorder focuses on restoring joint movement and reducing shoulder pain. Usually it begins with nonsteroidal anti-inflammatory drugs (NSAIDs) and physiotherapy. All corticosteroid injections generally bring moderate relief of pain not much change in ROM (Sandor, 2000). Physical therapy for frozen shoulder starts with reducing the pain and stiffness of the shoulder and increasing blood circulation (Pestic, 2006).

Assisted and active stretches to gain pain free range of motion and progressive strengthening exercises specifically for frozen shoulder area. It helps to reduce shoulder pain, improve full range of motion, function and proper biomechanics (Bruce, 2007).

For adhesive capsulitis, weight and non-weight bearing exercise to improve the flexibility of shoulder joint. The common exercise include arm swing with weight, arm raise, overhead stretch, stretching arms across the body and towel stretch (Pestic, 2006).

A home program that is performed three times a day (Blair, 2007). Physical therapy done at home including codman exercise, 'climbing the wall' or placing things up higher to encourage reaching, is cost effective with the patient of adhesive capsulitis (Lori, et.al, 1991).

Pendulum exercise may help improve shoulder motion and to relax the muscles around shoulder joint (Sandor, et.al, 2000).

Mobilization with Movement (MWM) is a class of manual therapy techniques that is widely used in the management of musculoskeletal pain (Teys, et.al, 2008). There are an increasing number of reports espousing the clinically beneficial effects of Mulligan's mobilization with movement (MWM) treatment technique (Vicenzino, et.al, 2007).

In Yang, et.al, 2007 showed that mobilization can be used to stretch the shoulder capsule and soft tissues. The goal is to restore normal joint motion and stability.

A study on the initial effects of a Mulligan's mobilization with movement technique on range of movement and pressure pain threshold in pain limited shoulders which is conducted by Teys, et.al, 2006. This study demonstrated that the application of Mulligan's MWM technique to participants with painful restriction of shoulder movement produced an immediate and significant improvement in ROM. Andrea, et.al, 2007 showed similar effect.

In Bangladesh there is no real statistics that how many patients are affected being adhesive capsulitis of the shoulder joint. There are some non-government and government organizations that are providing physiotherapy service to adhesive capsulitis patients. The researcher did not found any published statistics of adhesive capsulitis. Centre for the rehabilitation of the paralyzed is a non-government organization in Bangladesh. It is a unique specialized rehabilitation center in Bangladesh for the spinal cord injury patients with outdoor services. CRP strives to offer a high standard of physiotherapy service for patients with spinal cord injury, different musculoskeletal, neurological, pediatric, geriatric, other medical and surgical conditions.

Methodology:

Study design:

The study was a quasi-experimental between subject design. The most common quasi-experimental design is the comparison group pre-test/post-test design is used. In this study the samples were randomly assigned to control and experimental group.

Study site:

The study was conducted in musculoskeletal unit, Physiotherapy Department, CRP, Savar, Dhaka.

Study population:

The study population included patient with adhesive capsulitis of shoulder joint.

Sample size: Researcher selected 20 participants for this study. Among 20 participants male and female ratio was 1:3.

Sampling Technique: Convenient sampling was used to select the participants.

Data collection Technique: Data was collected through face to face interview by using questionnaire.

Data collection Instrument

A structured questionnaire was used for data collection. Visual Analogue Scale (VAS) was used for measuring the intensity of pain and goniometer for calculating Range Of Motion (ROM).

Data analysis:

Data was analyzed by using SPSS version 16. Computing the descriptive statistics- Bar chart, pie chart, percentage and parametric unrelated t-test to calculate the significance level of the study.

Results:

Reduction of shoulder pain:

The study find out the mean difference of reduction of pain on shoulder was 5 as opposed to 4.8. The result is not significant. Using t test on data of shoulder pain intensity ($t=0.212$, $df=18$, $p<0.10$). This result were not found to be significant ($p=0.05$ for one tailed

hypothesis). As the usual cut off point for claiming support for significance level of the experimental hypothesis is 5%. Therefore this study can say that the result is not significant.

Reduction of pain during wearing dress:

The mean scores of improvement of pain intensity on wearing dress for conventional physiotherapy with MWM and conventional physiotherapy were 6.3 as opposed to 3.9. Using t test on data of pain intensity on wearing dress ($t=3.810$, $df=18$, $p<0.0005$). This study is significant.

Reduction of pain intensity on reaching or placing object affect:

The 't' value of reduction of pain intensity on reaching or placing object is 2.681. The mean scores of improvement of pain intensity on reaching or placing object for conventional physiotherapy with MWM and conventional physiotherapy were 5.5 as opposed to 3.7. Using t test on data of pain intensity on reaching or placing object ($t=2.681$, $df=18$, $p<0.01$). Therefore the result was found to be significant.

Reduction of pain intensity on cooking effect:

The t value of reduction of pain intensity on cooking affect is 4.325. The mean scores of improvement of pain intensity on cooking affect for conventional physiotherapy with MWM and conventional physiotherapy were 5.1 as opposed to 3.6. Using t test on data of pain intensity on cooking affect ($t=3.325$, $df=18$, $p<0.0005$). The t has an associated probability level of less than 0.05% which means that the probability of random error being responsible for the outcome of the experiment is less than 0.05 in 100. Therefore this study can say that the result is significant.

Improvement of lateral rotation:

The t value of lateral rotation is 2.518. The mean scores of improvement of pain intensity on cooking affect for conventional physiotherapy with MWM and conventional physiotherapy were 26 as opposed to 13.5. Using t test on data lateral rotation ($t=2.518$, $df=18$, $p<0.01$). The t has an associated probability level of less than 1% which means that the probability of random error being responsible for the outcome of the experiment is less than 1 in 100. The result is significant.

Improvement of abduction:

The t value of abduction is 3.901. The mean scores of improvement of pain intensity on abduction for conventional physiotherapy with MWM and conventional physiotherapy were 26 as opposed to 13.5. Using t test on data abduction ($t=3.901$, $df=18$, $p<0.0005$). The t has an associated probability level of less than 0.05% which means that the probability of random error being responsible for the outcome of the experiment is less than 0.05 in 100. The result is significant.

Improvement of medial rotation:

The t value of medial rotation is 2.141. The t has an associated probability level of greater than 2.5% which means that the probability of random error being responsible for the outcome of the experiment is less than 2.5 in 100. As the usual cut-off point for claiming support for significance level of experimental hypothesis is 2.5%. So this study can say the result is significant.

Discussion:

The purpose of the study was to evaluate the effectiveness of the conventional physiotherapy intervention with MWM for adhesive capsulitis on shoulder compared to conventional physiotherapy intervention alone.

Yang et.al 2007 under took a review of mobilization techniques in subjects with frozen shoulder which design was randomized multiple treatment trial. Purpose was to compares the use of three mobilization techniques: end range mobilization, mid-range mobilization and mobilization with movement. The result shows that end range movement and mobilization with movement worked better than mid-range movement. In this study, it is also proven that mobilization with movement has effective range of motion and as well as function.

Teys et al, 2006 has done a research on the application of MWM on ROM and pain in adhesive capsulitis. The result indicated that MWM has an immediate positive effect on both ROM and pain in adhesive capsulitis. Another study of Andrea et.al, 2007 emphasized that the application of the Mulligan's MWM technique to participants with painful restriction of shoulder movement produced an immediate and significant improvement in ROM and reduce pain. But this study showed that MWM was effective for improvement of ROM and no effect on pain intensity with the subjects of adhesive capsulitis.

Sometimes patients receiving physiotherapy also take some analgesic drugs like NSAIDs. The effect of NSAIDs can greatly influence the level of pain and therefore hamper the result of the study. Again for the ethical consideration patient could not be deprived from any other management. To eliminate this chance of error the subjects who were taken analgesic drugs were requested not to take drugs at least twenty four hours before attending treatment session. Because when a single dose of NSAIDs is administrated then an analgesic action occurs whose action usually lasts 24 hours (Baxter 1998, pp.42).

In this study four session treatment were provided with a convenient interval. It would be better if the treatment sessions were arranged and fixed interval. Then the chance of error due to the interval of treatment sessions could be eliminated. To eliminate the chance of error by the treatment specific guideline for assessing, treating and recording were provided. The subject of each group got treatment of same mode, intensity and frequency.

In experimental research the reduction of bias or error depends on the amount of control that has been introduced in this study. Attempts were made to control the confounding variables. Some of confounding variables could not be controlled due to limitation, ethical issues as well as resources.

The study represent that conventional physiotherapy treatment with MWM (experimental group) was more effective than conventional physiotherapy (control group) with patients of adhesive capsulitis for improvement of ROM (lateral rotation, abduction and medial rotation). Pain intensity on shoulder, forearm and pain intensity on lying affect, reaching for something or placing an object are not support the hypothesis. But experimental group was more effective than control group for reduction of pain during wearing dress and during cooking affect.

Conclusion:

Adhesive capsulitis or frozen shoulder is a medical condition that involves progressive pain and loss of motion in the shoulder joint. In physiotherapy many intervention are used in the management of adhesive capsulitis. Among those MWM was used for this condition in different countries. In Bangladesh this technique is also used. But no recognized such type of research was done in this area. This study seemed to be the first study about practice of physiotherapy in Bangladesh.

This study represent that significantly for improvement of lateral rotation, abduction, medial rotation and reduction of pain during wearing dress and cooking affect among ten variables in conventional physiotherapy treatment with MWM was more effective than conventional physiotherapy treatment alone in patient with adhesive capsulitis of shoulder joint. Among ten variables significant level around five variables could not reject null hypothesis.

Reference:

- Johnson, A.J., Godes, J.J., Zimmerman, G.J. and Ounanian, L.L. (2007). The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis. *journal of orthopaedic & sports physical therapy*, 37(3), pp.88-99.
- Baxter, R. (1998). Research for health professional, F.A. Davis Company, Philadelphia.
- Blair, A. (2007). Adhesive Capsulitis, retrived March 13, 2008 from <http://www.scorth.net>.
- Chirra, A. (2005). Frozen Shoulder from Adhesive Capsulitis, vol.9.
- Dey, S. (2006). Pathology & Diagnosis study question_Frozen Shoulder, retrived April 09, 2008 from <http://www.w3.org>.
- Diabetes Forecast, (2002). Frozen Shoulder, retrived April 03, 2008 from <http://www.diabetes.org>.
- Dinnes, J. (2003). The effectiveness of diagnostic tests for the assessment of shoulder pain due to soft tissue disorders: a systemic review, vol. 7, pp4.
- Ferry, J. (2003). Frozen Shoulder. Retrived April 10, 2008 from <http://www.arthoscopy.com>.
- Inverarity, L. (2007). Adhesive Capsulitis, retrived March 26, 2008 from <http://physiotherapy.about.com/od/orthopicssandpt/a/Adhesivecap.html/>
- Lori, et.al, (1999). Adhesive Capsulitis: A sticky Issue, vol.59, no.7.
- Pesic, M. (2006). Method of Physical Therapy for Frozen Shoulder, Retrieved March 29, 2008 from <http://ezinearticles.com>.
- Sandor, R. (2000), Adhesive Capsulitis: Optimal Treatment of Frozen Shoulder, vol.28, no.9.
- Teys, P., Bisset, L. and Vicenzino, B. (2008). The initial effects of a Mulligan's mobilization with movement technique on range of movement and pressure pain threshold in pain-limited shoulders. *Manual therapy*, 13(1), pp.37-42.
- Vicenzino, et.al. (2007). Mulligan's mobilization with movement, positional faults and pain relief. *Current concepts from a critical review of literature*, vol.12, pp.98-108.
- Wilson, A. (2005). Frozen Shoulder Affects 3 percent of the population. Retrived March 03, 2008 from <http://www.med.ucla.edu>.
- Yang, I.J. (2007). Mobilization Techniques in Subjects with Frozen Shoulder Syndrome: Randomized Multiple Treatment Trial *Physical Therapy*, vol.87. pp. 204-210.