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Research Article

A Comparison between Myofascial Release (MFR) Technique along with Conventional Physiotherapy and only Conventional Physiotherapy on Patients with Adhesive Capsulitis at Shoulder

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Abstract

Aim: The aim of this study was to compare the effectiveness of Myofascial release technique (MFR) along with conventional physiotherapy and only conventional physiotherapy on subjects with adhesive capsulitis of shoulder.

Materials and Methods: This study includes 30 subjects randomly distributed into two groups (control group receive conventional physiotherapy and experimental group receive MFR technique along with conventional physiotherapy) including 15 subjects in each group. The mean age in the control group was 56.33 years and in experimental group was 54.64 years. Both male and female were included in the groups. Subject's ROM and pain assessment was made before the execution of treatment. ROM was done with the help of Universal Goniometer and the pain level measurement was done by Numeric Pain Rating Scale (NPRS) and functional disability by Shoulder Pain and Disability Index (SPADI). After completing of all the treatment sessions to both the groups again pain, ROM and functions were measured for outcome progression. Each group was treated for 12 sessions of 3 days in a week for 4 weeks.

Results: Subjects in the both groups overall improved. Greater changes were found within the groups statistically significant ($p < 0.05$) pre-test and post-test score of pain, function and range of motion (ROM). That was the mean of difference of pain intensity 2.40 (with sd 1.29) and functional disability 29.66 (20.04) in experimental group and pain intensity 2.26 (.79) and functional disability 27.86 (20.02) in control group. In active range of motion of shoulder (AROM) joints flexion 27.66 (with sd 19.35), abduction 38.66 (33.61), medial rotation 21.66 (17.28) and lateral rotation 25.66 (18.11) in experimental and active flexion 18.00 (11.46), abduction 22.66 (16.56), medial rotation 19.00 (13.25) and lateral rotation 18.33 (12.91) in control group. Similarly found passive flexion 25.33 (17.97), abduction 29.00 (26.06), medial rotation 23.66 (17.67) and lateral rotation 25.66 (18.50) in experimental and passive flexion 14.00 (9.29), abduction 20.66 (17.91), medial rotation 14.00 (12.70) and lateral rotation 17.66 (11.62) in control group. Insignificant differences were found for each of the variables between groups comparison.

Conclusion: The results of this study suggest that either Myofascial release technique (MFR) along with conventional physiotherapy or only conventional physiotherapy are equally effective interventions for patients with shoulder adhesive capsulitis.

Keywords: *Myofascial Release Technique; Shoulder Joint; Conventional Therapy*

Introduction

Adhesive capsulitis or frozen shoulder is a condition of uncertain etiology characterized by substantial restriction of both active and passive shoulder motion [1]. It is the main cause of shoulder pain and stiffness in everyday activities [2]. According to Center for the Disease Control and Prevention, about 13.7 million people in the United States sought medical care for shoulder problem [3]. Frozen shoulder affects about 20% of people with diabetes [4]. In India 2% of general population are incidences of frozen shoulder [5]. Adhesive capsulitis affects in both shoulder in up to 16 % of patients [6]. The prevalence of adhesive capsulitis for Bangladeshi male and female ratio is 1.8:1 [7].

Adhesive capsulitis or frozen shoulder occurs due to idiopathic or post-traumatic causes but the term adhesive capsulitis should be reserved for the idiopathic type of shoulder stiffness. Factors associated with adhesive capsulitis include female gender, age older than 40 years, trauma, immobilization, diabetes, thyroid disease, stroke, myocardial infarction and the presence of autoimmune diseases, cervical spine disorders and reflex sympathetic dystrophy syndrome [8].

Most limitation of passive lateral rotation and abduction is the main character of capsular pattern and it helps for diagnosis of shoulder capsulitis [9]. It has three stages. Stage one is called the freezing stage that lasts between 3 to 9 months and is characterized by an acute synovitis of the glenohumeral joint. The second stage is called the frozen or transitional stage and lasts anywhere 4 to 12 months. The third stage begins when range of motion (ROM) begins to improve and is called the thawing stage. This stage lasts from 12 to 42 months and is defined by a gradual return of shoulder mobility [10].

Management of frozen shoulder has been attempted via many strategies, including joint mobilization, which improves tissue extensibility, increases the range of motion, modulates pain, reduces soft tissue swelling and inflammation, increases synovial fluid levels and stimulates peripheral mechanoreceptors [11]. The principles of physiotherapy treatment are to relieve pain, maintain range of motion and ultimately to restore function. Based on the theories of muscle imbalance, clinicians assume that releasing of tight soft tissue and strengthening of the posterior scapular stabilizers combined with stretching of the pectoral muscles can correct the scapula-humeral rhythm. End range mobilization with scapular mobilization is more effective in improving range and functioning as compared to end range mobilization alone for adhesive capsulitis [12]. Myofascial tightness and muscular adhesions contribute to prevention of necessary upward rotation and create a mechanical block of humeral elevation. These restrictions can be decreased or minimized by myofascial trigger release techniques. Myofascial trigger points are present in these specialized soft tissue restrictions, this prevent smooth muscle contraction throughout the length of the muscle. The myofascial release technique is a very effective manual therapy for release of trigger point and tight soft tissues. So, there is a need for this study on Myofascial trigger point release technique.

Aim of the Study

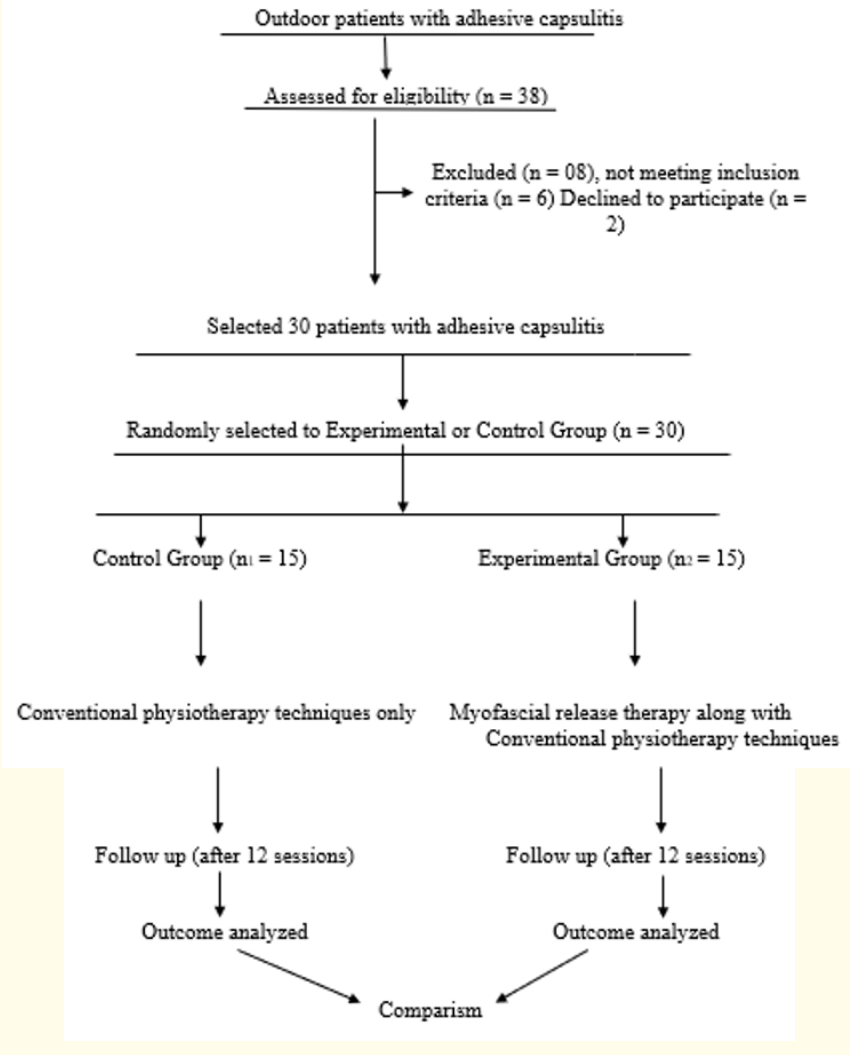
The aim of the study to find out the efficacy of myofascial release exercise around the scapular border for adhesive capsulitis in terms of decrease of pain, increase range of motion and improve functional activities.

Methodology

It was a Randomized Controlled Trail (RCT). A random sampling technique was used to two different groups of subjects, single blinding was used. The study was conducted in musculoskeletal Physiotherapy unit of the Centre for the Rehabilitation of the Paralyzed (CRP), Savar and Mirpur, Dhaka. The inclusion criteria were primary or idiopathic unilateral adhesive capsulitis with stage-II, shoulder pain with 3 months duration without any major trauma, both males and females were within age group of 40 to 65 years, limitation of passive lateral rotation, abduction and medial rotation, subjects who were willing to participate in the study. The exclusion criteria was participants with rotator cuff tears, labral tears, other shoulder ligament injuries, peri-arthritis shoulder secondary to fracture and dislocation, unhealed fractures and implants in the shoulder region. History of any arthritis related to shoulder joints like osteoarthritis and rheumatoid arthritis and osteoporosis in the shoulder region, reflex sympathetic dystrophy, neurological disorder Stroke with residual upper limb involvement, disorder of cervical spine, elbow, wrist or hand and any other pathology or malignancy, subject had taken corticosteroid injections in the affected shoulder taken 1 month before they excluded from this study.

Method of data collection

To conduct this study, researcher collected data through using different types of data collection tools named Pain measured with pain numeric rating scale (PNRS), goniometer and shoulder pain and disability index (SPADI) scale. The assessor collect data through a close ended structural questionnaire, face to face interviews and assessing the patient, initial recording, treatment and final recording.



Figure

Intervention

Total 12 graduate physiotherapists were selected out of 23. Protocol of conventional physiotherapy was obtained from head of Physiotherapy Department, CRP. The researchers arranged special training about the myofascial release technique (MFR) protocol with type of exercise, dose and treatment duration. The experimental group received myofascial release technique (MFR) exercise with conventional therapy and control group receive only conventional therapy.

Data analysis

Data were analyzed by using SPSS version 16 to compute the descriptive statistics using pie chart, bar chart, and percentage. Between group analyses of pain, range of motion and disability has been compared by using *t*-test. Within group of pain, range of motion and disability were checked by paired t test.

Results

Variables	Experimental group	Control group
Age (Mean with SD)	54.64 (10.19)	56.33 (6.86)
Sex (% and number)	Male 33.3% (n = 5) Female 66.7% (n = 10)	Male 53.3% (n = 8) Female 46.7% (n = 7)
Height (Mean with SD)	1.56 (.08)	1.75 (.08)
Wight (Mean with SD)	62.27 (7.22)	64.73 (7.30)
BMI (Mean with SD)	26.09 (3.08)	26.02 (2.26)
Major working Position (% and number)	Sitting 73.3% (n = 11) Standing 20% (n = 3) Traveling 6.7% (n = 1)	Sitting 86.7% (n = 13) Standing 13.3% (n = 2)
Diabetics (% and number)	Yes 26.7 % (n = 4) No 73.3% (n = 11)	Yes 33.3% (n = 5) No 67.7% (n = 10)
Pain intensity (pre-test) (Mean with SD)	6.47 (1.50)	6.47 (1.72)
Disability on SPADI (pre-test) (Mean with SD)	82.33 (23.5)	83.20 (36.07)
Received previous treatment	Medical treatment 6.7% (n = 1) Pain killer 33.3% (n = 8) Traditional medicine 60% (n = 9)	Medical treatment 6.7% (n = 1) Pain killer 53.3% (n = 8) Traditional medicine 40% (n = 6)

Table 1: *Baseline characteristics.*

The baseline characteristics of participants between experimental and control group. In addition, two groups did not show significant difference at baseline regarding demographic characteristics and disease related parameters. In experimental group, the mean age (SD) of the participants was 54.64 (10.19) years and in control group 56.33 (6.86) years. Male and female ratio in experimental was 1:1.97 while control group was 1: 0.88. Initial mean (SD) pain intensity in experimental group was 6.47 (1.50) and control group was 6.47 (1.72). In addition, mean (SD) weight in experimental group was 62.27 (7.22) kg and control group was 64.73 (7.30) kg. Similarly mean (SD) height was 4.90 (.33) meter in experimental group and 64.73 (7.30) meter in control group participants. Major working position of the participant specially sitting 73.3% (n = 11) in experimental group and 86.7% (n = 13) was in control group. Chronic illness diabetic mellitus (DM) had in experimental group 26.7 % (n = 4) and in control group 33.3% (n = 5). Mean (SD) functional disability on SPADI in experimental group was 82.33 (23.5) and in contrast mean (SD) in control group was 83.20 (36.07). Major working position (sitting position) in experimental group was 73.3% (n = 11) and in control group was 86.7% (n = 13).

Comparative evaluation within the groups (pre and post treatment)

Comparative pain intensity within group analysis found significant improvement in both experimental group and control groups ($p < 0.01$) and in case of functional disability also found significant in both groups.

Mean difference and comparison of AROM of shoulder joints (glenohumeral) both groups

The mean difference of active range of motion is increased in experimental group (MFR group) in terms of active shoulder flexion, abduction, medial rotation and lateral rotation compare with control group. The comparative active range of motion (AROM) of shoulder joints found significant ($p < 0.01$) improvement in active flexion, abduction, medial rotation and lateral rotation in both experimental and control groups that mean myofascial release technique (MFR) and conventional physiotherapy is effective for increase range of motion (ROM) of adhesive capsulitis patients.

Mean difference and comparison of PROM of shoulder joints (glenohumeral) both groups

The Mean of the difference of PROM of flexion, abduction, medial rotation and lateral rotation in experimental group was higher than control group. Comparative of passive range of motion (PROM) showed that significant ($p < 0.05$) improvement of passive flexion, abduction, medial rotation and lateral rotation in both experimental and control groups.

Mean difference and comparison of AROM of shoulder girdle both groups

The greater mean of the difference was in the control group that mean conventional physiotherapy was effective in increasing in the active range of motion of shoulder girdle of patient with adhesive capsulitis of shoulder joints. But the comparison between before and after treatment, outcome of active range of movement shoulder girdle in both groups found significant improvement in control group as well as experimental group.

Mean difference and comparison of PROM of shoulder girdle both groups

The mean differences of PROM of shoulder girdle is better in the control group and in comparison, the passive forward elevation had significant outcome in experimental group while passive external rotation, internal rotation and cross body adduction were good result in control group.

The mean difference and comparison in SPADI scale of both groups

The mean differences were higher within the experimental group then control group on pain and functional disability of adhesive capsulitis. The general pain intensity was (significant $p < 0.05$) improvement in both experimental and control group, improvement of functional disability in both groups, improvement of total disability score was also good in both groups. Differently found total pain and functional score on SPADI scale was also significant ($p < 0.05$) in both groups.

Pain status

General pain intensity

In this study it is found that general pain intensity in the experimental group observed *t* value is 7.159 at two tailed paired *t* test while this same variable for control group the observed value is 10.99 within group. At 5% level of significant with 14 degree of freedom standard *t* value is 2.145 and observed *t* value in general pain intensity in both group are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect of general pain intensity it is significant at 0.1% level of significant.

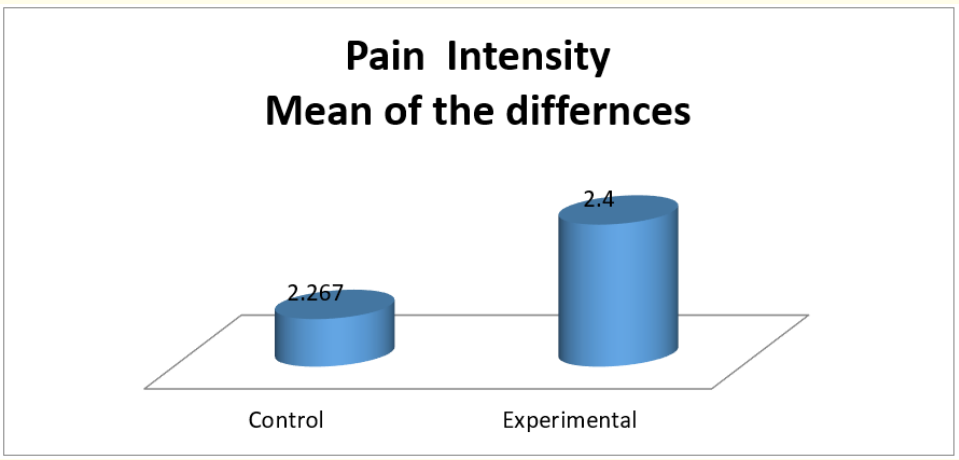


Figure 1: *Numeric pain rating scale in two groups.*

Discussion

The aim of this study is to compare the effectiveness of the myofascial release along with conventional physiotherapy and only conventional physiotherapy of the subjects with adhesive capsulitis to reduce pain, to improve the mobility and to improve the functional abilities.

The present study found almost similar baseline characteristics of the participants. See table 1.

In this study it is found significant ($p < 0.05$) change mean of difference of pain intensity 2.40 (0.29) and functional disability was 29.66 (20.04) in experimental group and in control group for pain 2.26 (.79) and functional disability 27.86 (20.02).

A RTC study found that myofascial trigger point release technique on three border of scapula reduces pain and increase range of motion as well as shoulder function [13]. Similarly, another study stated compare the efficacy of treatment strategies - Myofascial release Arm-pull technique and Maitland's joint mobilization technique in patients with adhesive capsulitis. Statistical analysis showed significant difference in Myofascial release Arm pull technique compare with Maitland's mobilization in respect to pain, function and range of motion [14].

In addition, a study mentioned that insufficient scapula humeral rhythm and posterior tipping of the scapula during arm elevation are important to consider in rehabilitation of patients with adhesive capsulitis. The treatment session is twice a week for 8 weeks. Range of motion (ROM) and disability score were measured at the beginning, 4 weeks and 8 weeks. Subjects in the end-range mobilization/scapular mobilization treatment approach group (experimental group) experienced greater improvement than control group at 4weeks. Usage of scapular mobilization exercise with soft tissue release technique and static progressive stretch device has a beneficial long-term effect on shoulder range of motion, pain and functional outcomes in patients with adhesive capsulitis of the shoulder [15].

The present study's findings showed that outcome of both groups (control and experimental) was good. Within group analysis the mean pre-test and post-test analysis shows for both the group a significant outcome in pain reduction, improve range of motion and functional activities. But between groups analysis no significant outcome between experimental group (MFR plus conventional physiotherapy) and control group (only conventional physiotherapy) were found. So individually in both groups it is found positive outcome in term of pain reduction and disability. But this experimental study didn't found any superior effect in experimental group (myofascial release technique plus conventional physiotherapy) over the control group (conventional physiotherapy). The sample size is really very small, so the result is difficult to generalize for total population. As a consequence of this study it is recommended to do further study with large number of subjects and with a longer time period.

Conclusion

The manifestations of adhesive capsulitis are not only pain but also limitation in movements and restriction to activities of daily living. The result of the study has identified the effectiveness of Myofascial release technique (MFR) along with conventional physiotherapy and only conventional physiotherapy both are effective in adhesive capsulitis of shoulder joints. This result will aid the professionals to decide the specific evidence-based protocol for applying interventions in Adhesive capsulitis.

Bibliography

1. Griggs SM., *et al.* "Idiopathic adhesive capsulitis: a prospective functional outcome study of non -operative treatment". *Journal of Bone and Joint Surgery* 82.10 (2000): 1398.

2. Ludewig PM and Reynolds JF. "The association of scapular kinematics and glenohumeral joint pathologies". *Journal of Orthopaedic and Sports Physical Therapy* 39.2 (2009): 90-104.

3. Thomas SJ., *et al.* "Prevalence of symptoms and signs of shoulder problems in people with diabetes mellitus". *Journal of Shoulder and Elbow Surgery* 16.6 (2007): 748-751.

4. Kordella T. "Frozen Shoulder and Diabetes". *Diabetes Forecast* 55.8 (2002): 60-64.

5. Page P and Labbe A. "Adhesive capsulitis: use the evidence to integrate your interventions". *North American Journal of Sports Physical Therapy: NAJSPT* 5.4 (2010): 266.

6. Contractor ES., *et al.* "Effect of Muscle Energy Technique on Range Of Motion in Cases of Patients with Adhesive Capsulitis". *International Journal of Health Sciences and Research (IJHSR)* 6.9 (2016): 252-256.

7. Al Hasan S., *et al.* "Study of spectrum of rheumatic diseases in the department of physical medicine and rehabilitation, Chittagong Medical College Hospital, Bangladesh". *Journal of Chittagong Medical College Teachers' Association* 20.1 (2009): 6-11.

8. Ibrahim MM and Ali HA. "Influence of High Grade Mobilizing Exercise on Shoulder Function in Frozen Shoulder". *Bulletin of Faculty of Physical Therapy* 16.2 (2011).

9. Magee JD. "Orthopedic Physical Assessment". Saunders, 4th edition (2002).

10. Manske RC and Prohaska D. "Diagnosis and management of adhesive capsulitis". *Current Reviews in Musculoskeletal Medicine* 1.3-4 (2008): 180-189.

11. Kelley MJ., *et al.* "Shoulder pain and mobility deficits: adhesive capsulitis: clinical practice guidelines linked to the international classification of functioning, disability, and health from the Orthopaedic Section of the American Physical Therapy Association". *Journal of Orthopaedic and Sports Physical Therapy* 43.5 (2013): A1-31.

12. Sreenivasu K., *et al.* "Effectiveness of end range mobilization with scapular mobilization in frozen shoulder". *International Archives of Integrated Medicine* 3.8 (2016): 53-58.

13. Bron C., *et al.* "Treatment of myofascial trigger points in patients with chronic shoulder pain: a randomized, controlled trial". *BMC Medicine* 9.1 (2011): 8.

14. Deshmukh SS., *et al.* "A comparative study to assess the effectiveness of Soft Tissue Mobilization preceding joint mobilization technique in the management of Adhesive Capsulitis". *Indian Journal of Physiotherapy and Occupational Therapy* 8.1 (2014): 93.

15. Yang JL., *et al.* "Effectiveness of the end-range mobilization and scapular mobilization approach in a subgroup of subjects with frozen shoulder syndrome: a randomized control trial". *Manual Therapy* 17.1 (2012): 47-52.

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