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Original research article

Efficacy of Myofascial Release with Mobilization in patient with Frozen Shoulder

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Abstract

Background: Frozen shoulder is a condition that affects your shoulder joint. It usually involves pain and stiffness that develops gradually, gets worse and then finally goes away. It affects women slightly more often than men. With frozen shoulder, the capsule becomes so thick and tight that it's hard to move. Bands of scar tissue form and there's less of a liquid called synovial fluid to keep the joint lubricated. These things limit motion even more. Patients presenting with frozen shoulder will often report an insidious onset with a progressive increase in pain, and a gradual decrease in active and passive range of motion. Most patients are still managed by physiotherapy in primary care, and only the more refractory cases are referred for specialist intervention various treatment approaches help to reducing the pain, stiffness like Myofascial release, trigger point therapy, ultrasound, mobilization, cold therapy ,heat therapy stretching etc.

Objective: The objective of this study is to find out the effectiveness of myofascial release with mobilization vs ultra sound with mobilization on patients who suffer from frozen shoulder.

Methodology: A total of 15 patients of frozen shoulder were included in the study. All patients were treated with myofascial release with mobilisation and ultra sound with mobilization. Patients were treated 4 times per week for the 12 weeks treatment duration was individually 15 to 20 minutes per session included rest time.

Result & Conclusion: The results of this study indicates that there is a significant difference between effect of myofascial release with mobilization and ultrasound with mobilization in patients with frozen shoulder.

Keywords: Myofascial Release(MFR), frozen shoulder, Ultra sound, Mobilization.

Introduction

One of the common conditions in shoulder joint is frozen shoulder. It usually clinically correlated with pain and stiffness that develops gradually, gets worse and then finally goes away. Shoulder is consists of three bones that form a ball-and-socket joint. Tissue are surrounded by the joint that help to protect the joint and bone form further injury. This is called as shoulder capsule. With progression of frozen shoulder, the capsule becomes thick and tight that it's resulting to stiffness in the joint. Shoulder joint consist of synovial fluid which act as lubricant help to keep joint mobile when the band of scar tissue are cover the joint make it stiff and immobile leads to these limit the range and motion even more. Patients presenting with frozen shoulder will often report an insidious onset with a progressive increase in pain, and a gradual decrease in active and passive range of motion. One of the main presenting factors is loss of external rotation (ER) [2] in a dependent position with the arm down by the side [4]. Patients frequently have difficulty with grooming, performing overhead activities, dressing, and particularly fastening items behind the back [3, 4]. Frozen shoulder is considered to be a self-limiting disease with sources stating symptom resolution as early as 6 months up to 11 years. Unfortunately, symptoms may never fully subside in many patients. People who have thyroid disease, diabetes, an autoimmune disease, and/or injury, stroke, heart attack or prolonged immobilization are also at higher risk to develop frozen shoulder. Most patients are still managed by physiotherapy in primary care, and only the more refractory cases are referred for specialist intervention. Various treatment approaches help to reducing the pain [4], stiffness like Myofascial release, ultrasound [6], mobilization [3, 13, 15], cold therapy, heat therapy stretching etc. Myofascial release massage is use as therapy which focuses on the skeletal muscle pain and immobility. Myofascial release therapy is applying gentle pressure to soft tissue which consists of connective tissue and fascia. Fascia is a structure which made up of connective tissues that surround muscles, blood vessels, and nerves [7]. In healthy individual, fascia tissue became a relaxed and wavy in configuration. A myofascial release technique helps to reduce restrictions and can facilitate the release of the fascia. Like Injury, surgery, poor posture, or inflammation of tissues can leads to myofascial

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restrictions that produce pressure and pain upon sensitive structures. Deep heat therapy and superficial heat therapy are two types of thermotherapy. While deep heat modality like ultrasound, shortwave, and microwave diathermy target deeper tissues within 3-5 cm of the tissue surface, superficial heat modality like hot packs and moist heat only raise the temperature of superficial tissues to a depth of around 1 cm [8]. Particularly, it is known that ultrasonic therapy (US), which is frequently used to treat frozen shoulder, causes molecular vibrations that aid in the breakdown of dense collagenous structures within the capsule. For tissue healing, US can be carried out at either 1 or 3 MHz [9]. Half-value depth [11], which refers to the distance at which 50% of the therapeutic heat energy lost, is typically used to determine the depth of penetration. In order to target deeper tissues, such as those between 2.5 and 5 cm, 1 MHz is typically employed, whereas 3 MHz is frequently used for more superficial tissues, to a depth of between 0.8 and 1.6 cm [9]. This is because US is known to create heat energy between 1 and 2 half-value depths; however, it is unclear if using US alone or in combination with other therapies can help treat frozen shoulder.

Objective of study

The objective of the study is to compare the effectiveness of myofascial release with mobilization vs ultra sound with mobilization on patients with frozen shoulder.

Materials and Methods

1. Subjects

A total of Active 30 individuals between the age of 40-60 having symptoms with a frozen shoulder and who met the inclusion criteria of study were participated in this study.

2. Inclusion criteria

- Participants of age group (40 - 60 years), both male and female patients.
- Willingness to participate in the study.

3. Exclusion criteria

- Participants below age group (< 40 years).
- History of Shoulder Injury.
- Any condition diagnosed with help of MRI
- No patients will be taken in the study unwillingly.

4. **Clinical examination:** The patients of frozen shoulder diagnosed by functional examination. Range of motion and VAS was used as outcome measure. VAS (Visual Analogue Scale) was used for measurement of acute pain.

5. **Procedure:** The subjects were fitted according to inclusion criteria and informed consent was taken from the patients and explained the procedure in detail. Appropriate treatment category was chosen according to plan for the patients for better effectiveness, proper treatment and thus better results.

MFR with mobilization protocol for patients:

Muscle - Pectoralis major and minor, trapezius, subscapularis
Time - 5 to 7min
Mobilization - Maitland
Anterior, inferior.
Grade - second grade.7 to 10 glide each min for 2 to 3 min
Time -15 min

Ultra sound with mobilization protocol for patients:

Frequency - 1 to 3 MHZ
Mode - Continue
Time - 5 to 7 min
Mobilization - Maitland
Anterior, inferior.
Grade - Second grade. 7 to 10 glide each min for 2 to 3 min
Time - 15 min

Note: Pacific Medical University, Institute's ethical approval obtained date 06/09/22, PMU/PMCH/IEC/2022/236. All participants completed information and consent form at recruitment.

Statistical Analysis

The data will be entered using Microsoft Excel and analysed using SPSS statistical software. Frequency,

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percentages, cross tables, Bar diagrams, Pie charts will be used for data summarisation and presentation. Descriptive and Inferential statistical analysis will be carried out and results on continuous measurements will be presented as Mean ± SD and results on categorical measurements in Frequency (Percentage). Kolmogorov-Smirnov test would be used to check the Normality of the data. Tests of significance used for Statistical analysis will be done by using Parametric or Non-parametric- Paired and Unpaired t test. Conclusions will be obtained by calculating & comparing P value with level of significance i.e. 5%.
The shift in score between pre and post-treatment in VAS and ROM of patients and continuous demographic variables (Age, sex) of patients was evaluated by comparing using an independent t-test. The mean difference + SD were used to represent the whole data. The paired t-test was performed to analyze the group's pre and post-differences. For a two-tailed (alpha-2) probability (p) value, $p<0.05$ was deemed statistically significant. Unpaired t test was performed to analyze difference between two groups.

Fig 1: Mean shoulder abduction Pre and Post intervention in two groups

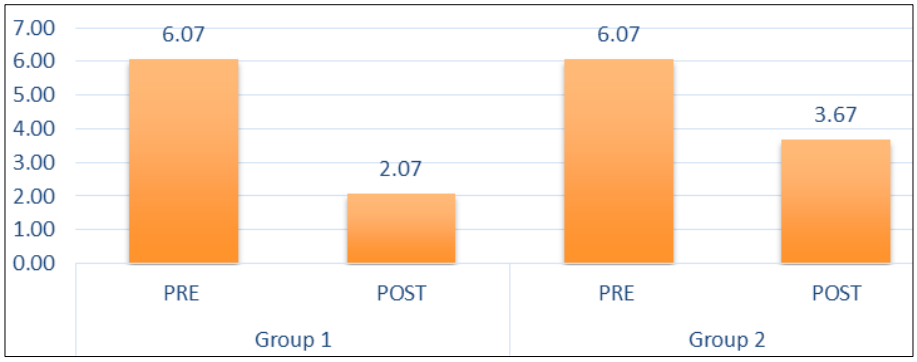

Fig 2: Mean VAS Pre & Post intervention in two groups

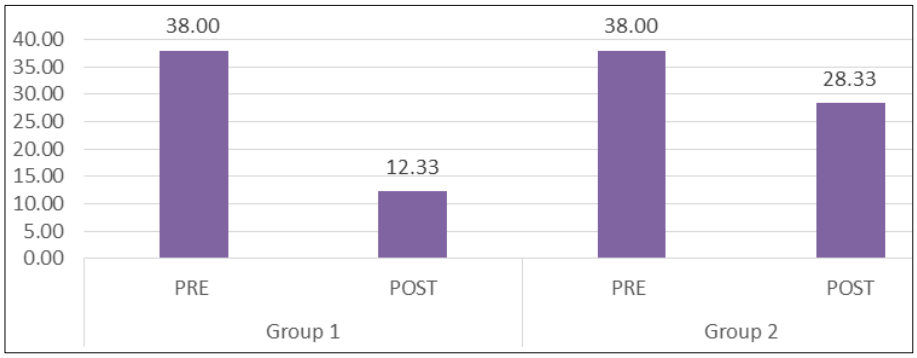

Fig 3: Mean external rotation Pre & Post intervention in two groups

Result

Individual technique showed a statistically significant difference between pre- and post-treatment with p value <0.0001. Group A showed pre-test ROM shoulder abduction Mean ± SD 55.33± 23.261 was and improve to 25.33± 10.60 in post-test with p value 0,0001. Shoulder ROM External rotation pre-test Mean ± SD was 38.00± 14.74 improve to 12.33 ± 7.04 in post-test with p value less than 0.0001. Visual Analog Scale showed Pre-test Mean ± SD was 6.07 ± 1.28 and improve to 2.07± 0.96 in post-test with p value of less than 0.0001. Group B showed pre-test ROM shoulder abduction Mean ± SD 57.33± 20.52 was and improve to 45.67± 17.10 in post-test with p value 0.0001. Shoulder ROM External rotation pre-test Mean ± SD was 38.00± 14.74 improve to 28.33 ± 12.05 in post-test with p value less than 0.0001. Visual Analog Scale showed Pre-test Mean ± SD was 6.07 ± 1.28 and improve to 3.67± 0.90 in post-test with p value of less than 0.0001.

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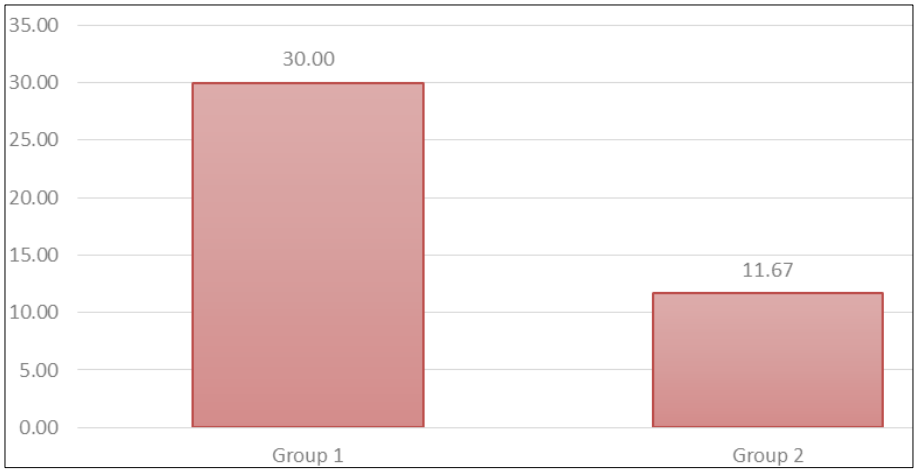

Fig 4: Mean Difference in shoulder abduction Pre & Post intervention in two groups

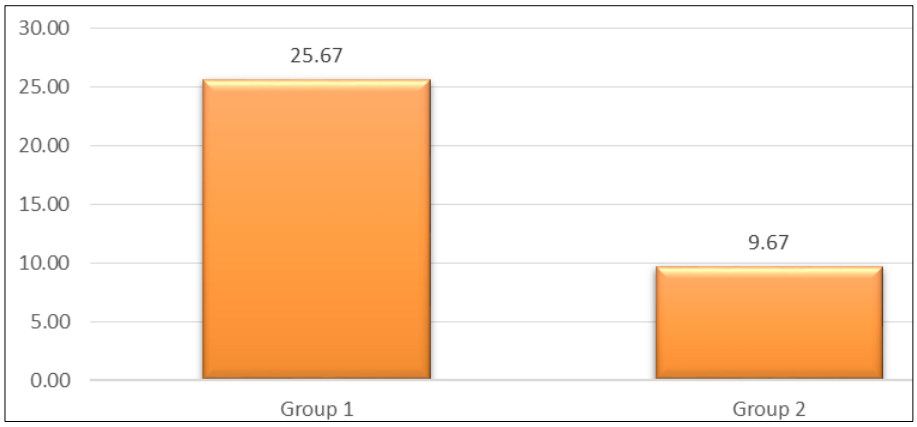

Fig 5: Mean Difference in external rotation Pre & Post intervention in two groups

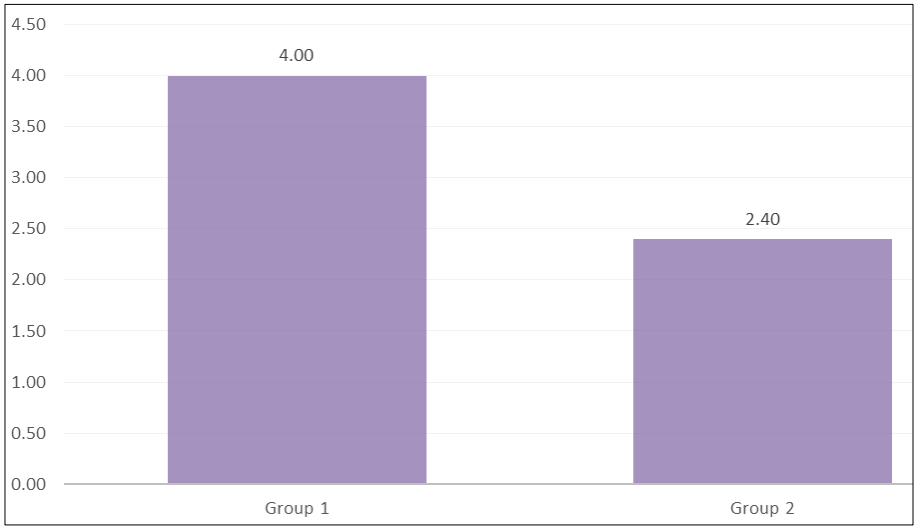

Fig 6: Mean Difference in VAS Pre & Post intervention in two groups

Table 1a:

VAS Difference	Group 1	Group 2
Mean	4.00	2.40
Standard Deviation	1.20	1.12
Median	4.00	2.00
Mode	5.00	2.00
Minimum	2.00	1.00
Maximum	6.00	5.00
KS test P value	0.4804	0.2844
P value	0.0008, ***	

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Table 1b:

ER Difference	Group 1	Group 2
Mean	25.67	9.67
Standard Deviation	9.23	3.52
Median	30.00	10.00
Mode	30.00	10.00
Minimum	5.00	5.00
Maximum	40.00	20.00
KS test P value	0.4048	0.0130
P value	< 0.0001, ***	

Table 1c:

Abd Shoulder Difference	**Group 1**	**Group 2**
Mean	30.00	11.67
Standard Deviation	16.48	5.56
Median	20.00	10.00
Mode	20.00	10.00
Minimum	10.00	5.00
Maximum	70.00	20.00
KS test P value	0.1914	0.0338
P value	0.0008, ***	

Discussion

This study emphasized on the comparative effect of MFR with mobilization vs ultrasound with mobilization in patients with frozen shoulder. It was seen that p value of both group was less than 0.0001 which showed statistical significance.

In the study, mean age of study population was 50 years, with 60% females & 40% males. According to recent research, it will occur in both shoulders in up to 40% to 50% cases. Frozen shoulder is estimated to affect 2% of the general population, with a cumulative incidence of 2.4 per 1000 person-years. It is rare before the age of 40, with a peak incidence between 40 and 60 and is unusual in patients over 70 years (except secondary traumatic frozen shoulder) and in manual workers. It affects women slightly more often than men.

In MFR with mobilization Group, a comparison of pre and post-test value of shoulder range of motion showed that there was a significant improvement in group A, abduction, pre-test mean value was 55.33degree & post-test value was 25.33 degree. External rotation, pre-test mean value was 38.00 degree & post-test value was 12.33 degree which demonstrates that MFR with mobilization was effective individually in improving range of motion. Myofascial release massage is a soft tissue treatment of skeletal muscle pain and immobility. A myofascial release technique helps to detect restrictions and can facilitate the release of the fascia. Article of 2017. Additional effect of trigger point therapy and myofascial release on second stage frozen shoulder among industrial workers showed that myofascial release has significant effect on improving range of motion.

In ultra sound with mobilization group, this study showed that significant impact on shoulder joint with a comparison of pre and post-test value of improving range of motion and reducing pain in group B. Pre-test mean value was 57 degree & post-test mean value was 45.67 degree for abduction. Pre-test mean value was 38.00 degree & post-test mean value was 28.33 degree for External rotation. Pre-test mean value was 6.07degree & post-test mean value was 3.67 degree for VAS. Thermo-therapy as heat increases tissue temperature and local blood flow, helping alleviate muscle and joint stiffness. Thermo-therapy is classified into superficial or deep heat therapy. Superficial heat modality such as hot packs and moist heat increases the temperature of superficial tissues to a depth of approximately 1 cm while deep heat modality such as ultrasound, shortwave, and microwave diathermy target deeper tissues within 3–5 cm of the tissue surface. Especially, ultrasound therapy (UST) commonly used for adhesive capsulitis treatment is known to create molecular vibration, which helps to break down dense collagenous tissues within the capsule UST can be performed at either 1 or 3 MHz for tissue healing.

According to an article of 2019, A randomized controlled trial of ultrasound guided pulsed radio frequency for patients with frozen shoulder, showed that duration period of 12 week is more beneficial than lees than 6 weeks.

In this study, comparison of MFR with mobilization Technique and ultra sound with mobilization showed that MFR with mobilization has better outcomes for reducing pain and improving range of motion with statistical significance of p value <0.01 analysed using unpaired-t test. The contributing factor for MFR being superior can be that it works on fascia level whereas ultra sound works on superficial layer of muscle. According to a study done in 2019. Effectiveness of scapular mobilization verses myofascial release of subscapularis on pain, ROM and function in subjects with chronic frozen shoulder: A comparative study. Thus, the positive implication from this study is that MFR has better

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results in reducing Level of pain and improving range of motion and should be used clinically for rehabilitation purposes. Also, this study supports the finding that MFR must give in 2nd grade frozen shoulder under supervision has better outcomes. Along with this, ultrasound has also shown improvements hence can be used as an adjunct.

Conclusion

There is a significant difference between effects of MFR with mobilization vs Ultrasound with mobilization in patients with frozen shoulder.

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