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Original Research Article

Effect of Muscle Energy Technique on Range Of Motion in Cases of Patients with Adhesive Capsulitis

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ABSTRACT

Introduction: Adhesive capsulitis is characterized by a painful, gradual loss of both active and passive glenohumeral motion resulting from progressive fibrosis and ultimate contracture of the glenohumeral joint capsule. Patients with Adhesive capsulitis have difficulties in everyday activities and shoulder pain disturbing sleep at night on the affected side.
Aim: This study is designed to evaluate the effect of Muscle Energy Technique on Range of Motion in Adhesive Capsulitis of Shoulder joint.
Materials and Methods: An Interventional study was conducted at Out Patient Department of General hospitals in Ahmedabad. The Pre-training outcome of Range Of Motion of External Rotation and Abduction of Shoulder Joint was taken. GROUP A: was given conventional treatment along with Muscle Energy Technique for adhesive capsulitis. Group B: not getting any additional training for adhesive capsulitis other than conventional treatment. The study was conducted for 6 months and treatment was given for 4 weeks 3 days a week and once a day. After 4 weeks post treatment outcome data were analysed for results.
Result: Data was analysed using SPSS software version 20 and Microsoft Excel 2007. In case and control Range Of Motion showed significant improvement (p; 0.05). But there was more significant improvement in case as compared to control group in Range of Motion for both, External Rotation and Abduction.
Conclusion: The Muscle Energy Technique is more effective in increasing Range Of Motion in patients with adhesive capsulitis as compared to conventional treatment.

Keyword: Muscle Energy Technique, Adhesive Capsulitis, Range Of Motion, Short Wave Diathermy, Statistical Package for Social Sciences.

INTRODUCTION

Adhesive capsulitis is characterized by a painful, gradual loss of both active and passive glenohumeral motion resulting from progressive fibrosis and ultimate contracture of the glenohumeral joint capsule. [(1)] The term "frozen shoulder" was first introduced by Codman in 1934. He described frozen shoulder as a painful shoulder condition of insidious onset that was associated with stiffness and difficulty in sleeping on the affected side. Codman also identified the marked reduction in forward elevation and external rotation that are the hallmarks of the disease. [(2)] Duplay first describes the symptoms in 1872 using the term 'periarthrite scapulohumerale'. [(3)] Neviaser coined the term 'adhesive capsuliti's after open surgery in affected shoulders. He observed sound like adhesive tape being pulled off when he manipulated the adhesive capsule of the shoulder. [(4)] The

incidence of FS is slightly higher in women than in men. This condition most frequently affects persons aged 40 to 60 years and rarely occurs in persons younger than 40 years of age. Frozen shoulder might affect both shoulders in upto 16% of patients; however, a relapse is uncommon. An increased incidence of FS has been noticed in patients with hyperthyroidism and hypertriglyceridemia. [(5)] Prevalence rate in the general population is 2-5% and 10-20% in diabetics. [(6)] Patients with FSS have difficulties in everyday activities (dressing, grooming, and performing overhead reaching activities and so on for a period of several months to several years) and shoulder pain disturbing sleep at night on the affected side, which is a key diagnostic sign. [(7,8)] Conservative treatment includes various exercise methods and physical therapy modalities such as hot-therapy, Transcutaneous electrical nerve stimulation (TENS), Ultrasound (US), Acupuncture and LASER (Light Amplification by Stimulated Emission of Radiations). Exercise programs consist of active and passive ROM exercises, stretching exercises guided by a physiotherapist, self stretching, manipulation and mobilization techniques, strengthening exercises, patient education and home exercises. MET is unique in its application as the client provides the initial effort while the practitioner facilitates the process. One of the main uses of this method is to normalize joint range, rather than increase flexibility, and techniques can be used on any joints with restricted Range of Motion (ROM) identified during the passive assessment. The main effects of MET can be explained by two distinct physiological processes: Post Isometric Relaxation (PIR) and Reciprocal Inhibition (RI). [(9)] There is lack of studies which states the effectiveness Muscle Energy Technique in Adhesive Capsulitis of shoulder joint. Hence, the present study is being undertaken with the intention to evaluate the effectiveness of Muscle Energy Technique in Adhesive Capsulitis of shoulder joint.

MATERIALS AND METHODS

An Interventional study was conducted at Out Patient Department of General hospitals in Ahmedabad. Simple Random Sampling was done. Ethical clearances were taken before commencing the study from the ethical committee of the institute and written consent forms from all the participants were collected. The subjects were selected according to inclusion and exclusion criteria. The inclusion criteria are Subjects within age group of 40-65 years, Both Genders, Subject having stiff painful shoulder for at least 3 month duration, Subjects with Idiopathic Frozen shoulder, Subjects with Diabetes Mellitus, Adhesive Capsulitis with Limited Range of Motion of Shoulder Abduction and External rotation, Subjects with bilateral / unilateral adhesive capsulitis. The Exclusion Criteria are Rotator Cuff Tear, History of Rheumatic Arthritis, Malignancies in Shoulder joint, Periarthritis secondary o fracture, dislocation, Reflex Sympathetic Dystrophy, or any Neurological condition, Patients with Thoracic Outlet Syndrome, Peripheral Nerve Injury. Pre-training outcome measure of External Rotation and Abduction Range of Motion of Shoulder joint was taken. And then subjects were divided into two groups' one case and other control. GROUP A: The mean age of this group was 51.7 ± 5.8. The group was given conventional treatment along with MET for adhesive capsulitis MET for shoulder joint was given as shown in the figures 1 and 2. GROUP B: The mean age of this group was 54.4 ± 6.7. The group was not given any additional training for adhesive capsulitis other than conventional treatment. Conventional Treatment in the form of SWD 20 minutes with capacitor field method, Codman's Exercises, Rope and Pulley, Wall and Ladder Exercise, Shoulder Wheel Exercise, Self Stretching Exercise. The study was conducted for 6 months and treatment was given for 4 weeks 3 days a week and once a day. The pre treatment data were collected before the treatment and after 4 weeks post treatment outcome data were collected for analysis.

Statistical analysis

Level of significance was kept at 5%. Within group analysis was done using paired t test and between group analysis was done using Mann Whitney U test and independent t test.

Figure 1: Muscle Energy technique for Restricted Abduction.

Figure 2: Muscle Energy Technique for Restricted External Rotation.

RESULTS

Thirty patients who fulfilled all the inclusion criteria were divided into two groups, fifteen in control group and fifteen in case group. There no drop outs in experimental group as well as in control group as the patients were dedicated to the study. Study was completed with 30 patients with 15 patients in each group. Data was analysed using SPSS software version 20 and Microsoft Excel 2007. Before applying statistical tests, data was screened for normal distribution. All the outcome measures were analysed at baseline and after 4 weeks of treatment. Level of significance was kept at 5%. Changes in outcome measures were analysed within group as well as between groups.

Following table shows the tests used to analyse the data.

Table 1: Age Distribution of subjects

Group	No	Mean	±SD
Group A	16	51.7	5.8
Group B	14	54.4	6.7

Table 2: Shows mean difference between Pre and Post External ROM value in A and B group. (Paired sample t test)

Group	Pre treatment		Post treatment		t value	p value
	Mean	±SD	Mean	±SD		
A	22.62	8.28	64.43	5.98	-27.36	0.0001
B	25.42	7.24	55.21	6.33	-20.76	0.0001

For Group A & B, within group comparison with paired sample t test yielded p Value 0.0001 for both the groups. And t= -27.36 for group A and -20.76 for group B. Suggesting that both the groups improved significantly after intervention.

Table 3: Showing mean change in External ROM value for both the group after intervention (independent t test)

Group	Mean of Post treatment score	±SD	t value	P value
A	64.43	5.9	5.68	0.0001
B	55.21	6.33		

An independent t test yielded p value 0.0001, indicative of significant difference, t= 5.68 suggesting that group A receiving Muscle Energy Technique improved much better than group B receiving Conventional Treatment in terms of EROM.

Table 4: Shows mean difference between pre and post Abduction ROM value in group A and B. (paired sample t test)

Group	Pre treatment		Post treatment		t value	p value
	Mean	±SD	Mean	±SD		
A	94.8	9.8	144.1	6.4	-25.96	0.0001
B	94.3	9.7	131.5	5.6	-19.74	0.0001

For Group A & B, within group comparison with paired sample t test yielded p Value 0.0001 for both the groups and t= -25.96 for group A & -19.74 for group B. Suggesting that Both the groups improved significantly after intervention.

Table 5: Showing mean change in Abduction ROM value for both the group after intervention (Mann -Whitney U Test)

Groups	Mean of post treatment scores	±SD	U value	P value
A	144.1	6.4	56	0.020
B	131.5	5.6		

The two-tailed Mann-Whitney U Test yielded p value 0.0001, indicative of significant difference, U=56, suggesting that group A receiving Muscle Energy Technique improved much better than group B receiving Conventional Treatment in terms of AROM.

The above findings suggest that there is statistically significant difference between the group A and group B in terms of ROM in Adhesive Capsulitis of shoulder joint.

DISCUSSION

The current study was conducted to find out the effect of Muscle Energy Technique in patients with Adhesive Capsulitis on External Rotation Range of Motion and Abduction Range of Motion. In this study both the techniques are effective in increasing Range of Motion but Group A is more effective than Group B. Both the groups had received Short wave diathermy. The probable mechanism for pain relief is that the deep heating effect of SWD increases the temperature of localized tissue, so vascular dilatation is promoted and the pain threshold elevated. Such vascular improvement also accelerates the process of inflammation by increasing nutrition and oxygen supply, and by removing metabolites and waste products. This leads to a decrease in pain and swelling and increasing the range. The results of the present study are similar as found by May S. F. Leung, and Gladys L. Y. Cheing (2008) [(10)] conducted a study on Effects of deep and superficial heating in the management of frozen shoulder. Results shows the addition of deep heating (SWD) to stretching exercises produced a greater improvement in pain relief, and resulted in better performance in the activities of daily living and in range of motion than did superficial heating (Hot packs). Both the groups had received Conventional Exercises. The probable mechanism for pain relief is that Exercises within the pain free range of motion stimulates mechanoreceptors and decreases pain. Exercises within pain free range also move the synovial fluid, thus decrease inflammation and decreased pain and increase range of motion. [(11)] For Group A, The mechanism behind increase in ROM by MET is that muscle contraction against equal counterforce triggers the Golgi tendon organ. The afferent nerve impulse from the Golgi tendon organ enters the dorsal root of the spinal cord and meets with an inhibitory motor neurone. This stops the discharge of the efferent motor neurone's impulse and therefore prevents further contraction, the muscle tone decreases, which in turn results in the agonist relaxing and lengthening, so there is increase in the ROM. The finding of the present study are similar as found by Gupta S, Jaiswal, P. (2008) [(12)] Suggesting that Post isometric relaxation is more effective in decreasing pain and disability and improving cervical range of motion as compared to isometric exercises over a period of three weeks in patients having non-specific neck pain. In Muscle Energy Technique, mechanical changes may include breaking up of adhesions, realigning collagen, or increasing fibre glide when specific movements stress the specific parts of the capsular tissue. One of the limitations of this study was the small sample size, so the results could not be generalized to population Age group was limited i.e. 40 to 60 years. There was no specific follow up of the subjects.

CONCLUSION

Thus, it can be concluded that MET is more effective in improving Range Of Motion of Shoulder Joint as compared to Conventional Treatment.

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