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The Effectiveness of Muscle Energy Technique in Patients with Adhesive Capsulitis

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ABSTRACT

OBJECTIVE:

The objective of study was to find the effectiveness of muscle energy techniques (METs) in patients with adhesive capsulitis.

METHODOLOGY:

Study was conducted in population of Sargodha seeking physiotherapy treatment for adhesive capsulitis in physiotherapy rehabilitation departments and centers. Study was randomized, controlled and multicenter. 50 patients were selected by inclusion and exclusion criteria and were divided into two groups by lottery method of randomization. Group I obtained muscle energy technique. Group II was controlled that obtained conventional treatment in the form of heat and range of motion exercises. Duration of study was 06 month. Interventions were carried out for two weeks (total 10 sessions). A baseline measurement was taken on shoulder pain and disability index (SPADI). A post intervention measurement was taken on same outcome measurements tools and was compared by independent t test.

RESULTS:

The pre intervention measurements on Shoulder Pain Disability Index were 61.11 in control and 61.18 in METs group. The post intervention measurements on Shoulder Pain Disability Index were 49.33in control and 27.69 in METs group.

CONCLUSION:

This study concluded that METs techniques are effective in treatment of adhesive capsulitis to decrease the pain and disability in comparison to control groups.

KEY WORDS: Frozen shoulder, adhesive capsulitis, METs, SPADI

INTRODUCTION:

Duplay was the first who identified frozen shoulder as a “peri-arthritis” in 1872 [1]. After that Codman labeled this condition “frozen shoulder” in 1935 [2]. In 1945 termed “adhesive capsulitis” was originated by Neviaser. He identified that pathology is in capsule of joints. There is formation of adhesions in capsule of the joints and synovial fluid became thick [3]. Now it is recognized as inflammatory or fibrosing condition of shoulder joint. Frozen shoulder and adhesive capsulitis are two terms that are interchangeable in literature.

Exact cause of frozen shoulder is still unknown, however it is associated with diabetes mellitus, hyperthyroidism, post operative surgeries (mastectomy, coronary artery bypass grafting CABG), post stroke, immobilization of upper limbs after fracture and some time without any reason (idiopathic frozen shoulder) [4]. Disease is very common among diabetes patients in Pakistan as compare to foreigner diabetes patients [5]. When discussing the etiology of frozen shoulder, it is classified into primary and secondary disease. Primary frozen shoulder has unknown pathology and labeled as idiopathic. Secondary disorder is associated with post operative immobilization, traumatic shoulder injury and post fractured immobilization of shoulder joint. Many patients with stroke develop adhesive capsulitis. In patients with CABG, shoulder hand syndrome is very common and constant source of pain and stiffness in arm. Frozen shoulder is largely associated with systemic conditions like diabetes mellitus, thyroid disease, Parkinsonism, cardiac and pulmonary diseases.

Incidence and prevalence of frozen shoulder are increasing when compared to past. Current rate is 2% to 3% in general population. Frozen shoulder is more common after 40s. Female is more affected as compare to male. About 70% are women presenting with frozen shoulder. 20 to 30 percent patients will develop frozen shoulder in opposite shoulder. Overall mean prevalence rate is 13.4 % in patients with diabetes mellitus. There is 30% prevalence of diabetes mellitus among

frozen shoulder patients. It affects 2 to 5 percent in general population [6]. It commonly affect the women between age 40 and 60 [6].

Muscle energy techniques are used by the active participation of the patients, patients is command to perform an isometric or isotonic muscle movement whose line of pull can produce the desire glide and therapist provide distal stabilization [7]. This is a soft tissue mobilization technique and also contributes in joint mobilization [8, 9]. In 1940's an osteopath named Fred Mitchell attributed this technique under the umbrella of manual therapy techniques [10]. METs can improve the length of shorten muscle, strengthen the weak muscles, improves the circulation and can mobilize the joint and soft tissues around it [11, 12]. METs can be classified as reciprocal inhibition, post isometric relaxation and joint mobilization [13].

Adhesive capsulitis is very common condition in Pakistan [14]. Incidence is increasing with time [15]. It is a chronic condition that involves the joint capsule. Patients have to bear a big cost on this condition. Moore and colleagues conducted a randomized control study on posterior shoulder tightness, to find the immediate effects of muscle energy techniques in baseball players by treating in single session. They concluded that a single MET session can improve the GHJ horizontal abductors in overhead athletes [16]. This study was conducted on healthy population. Present study was conducted on patients with adhesive capsulitis.

Adhesive capsulitis is very common ailment in Pakistan and a lot of work has been done over the time on different interventions. Effect of muscle energy techniques was little explored yet. Motive of doing this particular work was to improve the quality of patients with adhesive capsulitis and also find the effects of muscle energy techniques on adhesive capsulitis.

MATERIALS AND METHODS

The study design was randomized control trial. Settings of study were rehabilitations centers in Sargodha city i.e. DHQ teaching hospital, University medical diagnosis and research centre, Mubarak medical complex. Effects of study were measured in 06 months, from March, 1, 2017 to September, 31, 2017. Population of study was patients that visited to rehabilitation clinics for seeking treatments for adhesive capsulitis. A sample of 50 patients fulfilling inclusion and exclusion criteria were selected and was be divided into two groups by random table method. Sample was selected by following inclusion and exclusion criteria

Inclusion and exclusion criteria:

Inclusion criteria:

- Idiopathic frozen shoulder
- Sub acute and chronic stage of adhesive capsulitis
- Age between 25-55
- Both male and female gender

Exclusion criteria:

- arthritic shoulder
- rotator cuff disease
- post traumatic stiff shoulder
- post CABG shoulder hand syndrome

- post stroke frozen shoulder
- bilateral frozen shoulder

Outcome measurement tool was Shoulder Pain Disability Index (SPADI). Data was collected with the help of outcome measurement tool i.e. shoulder pain disability index. Demographic data like age, gender, and side of adhesive capsulitis are also collected. 50 patients were selected by inclusion and exclusion criteria and were divided into two groups by the method of randomization. Group I was obtained muscle energy technique. Group II was controlled that was obtained conventional treatment in the form of heat and range of motion exercises. Duration of study was 06 month. Interventions were carried out for two weeks (total 10 sessions). A baseline measurement was taken SPADI (shoulder pain and disability index). A post intervention measurement was taken on same outcome measurements tools. Descriptive statistics in the form of mean score and stander deviation was used to analyze the data and SPADI score was presented in mean percentage and standard deviation. T tests was used to compare the mean between the groups, with Significance level 0.05

RESULTS:

Mean age of participants were 48.06 ± 9.72 years. Range of age of participants was from 31.0 to 69.0 years. 30 (40%) males and 45 (60%) females were included in this study. 43 patients were with right adhesive capsulitis and 32 were with left adhesive capsulitis. The pre intervention measurements on Shoulder Pain Disability Index were 61.11 in control and 61.18 in METs group. The post intervention measurements on Shoulder Pain Disability Index were 49.33 in control and 27.69 in METs group.

ROM in MET group and Control Group:

Pre and post ranges measurement in flexion, abduction, internal rotation and external rotation were measured with the help of goniometer.

	FLEXION (degree)		ABDUCTION (degree)		INTERNAL ROTATION (degree)		EXTERNAL ROTATION (degree)	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
CONTROL	89.72	96.04	81.28	89.12	26.84	34.68	35.68	39.84
METs	83.68	99.12	68.64	82.80	29.48	46.80	31.68	45.12

Table 1 : pre and post ranges measurement in flexion, abduction, internal rotation and external rotation

Shoulder Pain Disability Index:

The pre intervention measurements on Shoulder Pain Disability Index were 61.11 in control and 61.18 in METs group. The post intervention measurements on Shoulder Pain Disability Index were 49.33 in control and 27.69 in METs group.

SPADI SCORE:	PRE-TREATMENT MEAN±SD	POST-TREATMENT MEAN±SD
CONTROL	61.11±8.79	49.33±9.95
METs	61.18±9.00	27.69±11.97

Table 2 : SPADI Score during Pre & Post treatment

DISCUSSION:

In this study effects of METs techniques were compared with the control in patient with frozen shoulder. Both treatments can produce significant change between pre and post treatments, if we compare the effectiveness between two groups then METs show more effectiveness. Results of this study can be compare with Suri and colleges. Suri and colleagues conducted a study on frozen shoulder in which they compared the muscle energy technique with Maitland techniques

and they concluded that muscle energy technique is more effective for control of pain whereas Maitland's technique has more effectiveness in increasing to range of motion and mobility of joint [17]. In this study they compared the Maitland method of mobilization with muscle energy techniques, but in this study kaltenborn technique was used. Study support that METs is more effective when compared. Results of this study support the study conducted by Shakil and colleagues. Shakil and colleagues conducted a study on adhesive capsulitis to compare the effects of Kaltenborn techniques and general scapular mobilization and they concluded that Kaltenborn mobilization is more effective when compared with general scapular mobilization [18].

CONCLUSION:

This study concluded that METs techniques are effective in treatment of adhesive capsulitis to decrease the pain and disability in comparison to control groups.

Ethical approval & Consent

This work was approved from Board of studies and advance research committee. An informed consent was taken from all the patients.

REFERENCES:

1. Lippmann RK. Frozen shoulder; periartthritis; bicipital tenosynovitis. *Archives of Surgery*. 1943;47(3):283-96.
2. Luime J, Koes B, Hendriksen I, Burdorf A, Verhagen A, Miedema H et al. Prevalence and incidence of shoulder pain in the general population; a systematic review. *Scandinavian journal of rheumatology*. 2004;33(2):73-81.
3. Sheridan MA, Hannafin JA. Upper extremity: emphasis on frozen shoulder. *Orthopedic Clinics*. 2006;37(4):531-9.
4. Brue S, Valentin A, Forssblad M, Werner S, Mikkelsen C, Cerulli G. Idiopathic adhesive capsulitis of the shoulder: a review. *Knee Surgery, Sports Traumatology, Arthroscopy*. 2007;15(8):1048-54.
5. Inayat F, Ali NS, Shahid H, Younus F. Prevalence and Determinants of Frozen Shoulder in Patients with Diabetes: A Single Center Experience from Pakistan. 2017.
6. Hsu JE, Anakwenze OA, Warrender WJ, Abboud JA. Current review of adhesive capsulitis. *Journal of shoulder and elbow surgery*. 2011;20(3):502-14.
7. Kisner C, Colby LA, Borstad J. *Therapeutic exercise: foundations and techniques*. Fa Davis; 2017.

8. Gugliotti M. The use of mobilization, muscle energy technique, and soft tissue mobilization following a modified radical neck dissection of a patient with head and neck cancer. *Rehabilitation Oncology*. 2011;29(1):3-8.
9. Chaitow L, Crenshaw K. *Muscle energy techniques*. Elsevier Health Sciences; 2006.
10. Pillay K. The relative effectiveness of muscle energy technique as opposed to specific passive mobilization in the treatment of acute and sub-acute mechanical low back pain 2005.
11. Chaitow L. *Modern Neuromuscular Techniques E-Book*. Elsevier Health Sciences; 2010.
12. Brill PW. *Muscle Energy Techniques. Modalities for Massage and Bodywork-E-Book*. 2014:131.
13. Addala D, Kumar KS, Madhavi K. Effectiveness of Muscle Energy Technique on Pain and Range of Motion on Osteoarthritis of Knee. *Indian Journal of Physiotherapy and Occupational Therapy*. 2013;7(4):29.
14. Kidwai SS, Wahid L, Siddiqi SA, Ghauri I, Sheikh I. Upper limb musculoskeletal abnormalities in type 2 diabetic patients in low socioeconomic strata in Pakistan. *BMC research notes*. 2013;6(1):16.
15. Karoli Y, Karoli R, Fatima J, Shukla V. Musculoskeletal Disorders in Patients with Type 2 Diabetes Mellitus. *International Journal of Health Sciences and Research (IJHSR)*. 2016;6(7):99-104.
16. Moore SD, Laudner KG, Mcloda TA, Shaffer MA. The immediate effects of muscle energy technique on posterior shoulder tightness: a randomized controlled trial. *journal of orthopaedic & sports physical therapy*. 2011;41(6):400-7.
17. Suri SA, Anand M. Comparative study on the effectiveness of Maitland mobilization technique versus muscle energy technique in treatment of shoulder adhesive capsulitis. *Indian Journal of Physiotherapy and Occupational Therapy*. 2013;7(4):1.
18. Shakil-ur-Rehman S, Danish KF, Khan A, Sheikh SI, Sibtain F. Comparison between Kaltenborn and General Scapular Mobilization in Adhesive Capsulitis Patients. *Journal of Rawalpindi Medical College (JRMC)*. 2012;16(2):121-2.