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EFFECTIVENESS OF KINESIOTAPING ALONG WITH KALTENBORN MOBILIZATION IN PATIENTS WITH SUB ACUTE ADHESIVE CAPSULITIS

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ABSTRACT

BACKGROUND: Adhesive capsulitis is condition characterized by progressive loss of both active and passive range of motion with potential of spontaneous resolution in 3 years. It is common in age group of 40- 65 years. Many studies have shown the effectiveness of kinesiotaping on adhesive capsulitis alone but there is a lack of studies that proves that if kinesiotaping along with mobilization will show any early recovery in patients with adhesive capsulitis. Thus there is need to see there is any effect of kinesiotaping along with kaltenborn mobilization in subacute adhesive capsulitis patients .

AIM: Aim of the study is to analyse the effectiveness of kinesiotaping along with kaltenborn mobilization in patients with subacute adhesive capsulitis.

OBJECTIVE: This study is to analyse the effectiveness of kinesiotaping along with kaltenborn mobilization in patients with subacute adhesive capsulitis.

METHODS AND MATERIALS: A total number of 15 subjects were age group between 40- 65 years with subacute adhesive capsulitis are randomly selected for this study. The subjects of this group are given treatment for a period of 4 weeks. Before and after the treatment the subjects with pain and disability were measured using Shoulder pain and disability index (SPADI) for taking pre-test and post-test values respectively. The t value is calculated by the pre-test and post-test values of SPADI.

RESULT: By the values of statistical analysis of the study show that kinesiotaping along with kaltenborn mobilization is effective for disability and relief in subacute adhesive capsulitis of shoulder joint.

KEYWORDS: Sub-acute adhesive capsulitis, kinesiotaping, kaltenborn mobilization, Shoulder Pain and Disability Index.

INTRODUCTION

The shoulder joint is ball and socket type of synovial joint and mobility of joint relies on congruent articular surfaces and dynamic stability by muscle around joint. The position of humerus and scapula must change throughout each movement in order to maintain stability i.e. scapulohumeral rhythm. Shoulder dysfunction is 2nd most common musculoskeletal problems affecting the population. But every condition has its differentiating characteristics and different period of recovery. It is common in age group of 40-65 years. Adhesive capsulitis is condition characterized by progressive loss of both active and passive range of motion with potential of spontaneous resolution in 3 years. The pain, stiffness and limited function of glenohumeral joint which adversely affects entire upper extremity. The incidence of adhesive capsulitis is 3-5% in general population and 20% in people with diabetes. The progression of adhesive capsulitis commonly has 3 stages in which there is severe pain, gradual restriction in ROM and pain resolution and last phase causes the recovery of range of motion.

However, it is also known that limited glenohumeral movement leads to an increase in scapulothoracic movement. During the 3-dimensional kinematic analysis of movements in adhesive capsulitis, increased external rotation and protraction of the scapula have been noted. The kinematic analysis of another study showed that there was significant impairment of humeral movements in patients with adhesive capsulitis in comparison to the control group. Such kinematic alterations cause a disruption in normal scapulothoracic rhythm. The decreased glenohumeral ROM cause increased or compensatory scapulothoracic motions.

During humeral elevation, increased upward translation of humeral head along with upward rotation of scapula had been reported in patients with adhesive capsulitis. Glenohumeral joint mobility decreases with scapular adhesions; this prevents external rotation of humeral head, and the humeral head slides below the acromion during humeral elevation. In adhesive capsulitis, inferior fold of capsule becomes tight which restrict the superior rolling of humerus which causes shrug sign. This posture causes scapulothoracic muscle and shoulder muscle

imbalance. Muscle imbalance and pain causes patients to attain slouched posture causing glenoid to move in downward rotated position, thus hanging arm is relatively in abduction on glenoid. This affects static stabilization due to which rotator cuff muscle come into action to maintain joint integrity. There are many treatment protocols for adhesive capsulitis comprising of exercises, soft tissue massage, taping, different modalities, manual therapy like Kaltenborn mobilization, Maitland mobilization, Mulligan mobilization for adhesive capsulitis Mobilization is widely used to improve range of motion and reduce pain. One of them is Kaltenborn mobilization, it can be used to increase range of motion and decrease pain by giving sustained stretch technique suggested by kaltenborn. Kaltenborn evaluates motion on articular surfaces and applies them to treatment according to concept of Kaltenborn – Evjenth. Kaltenborn mobilization involves application of passive sustained stretch technique to enhance joint mobility without articular surface suppression. Kaltenborn mobilization stretches tendon, ligament and capsule leads to improve physiologic accessory movements. Hence by kaltenborn mobilization by anterior and posterior translation of humeral head and stretching of capsule is helpful to increase range of motion.

In the subacute stage of adhesive capsulitis shoulder pain does not necessarily worsen but there is pain at end of ROM, use of arm is limited causing muscular disuse. This causes capsular pattern of limitation. The primary role of mobilization to restore joint play and facilitate joint movement by restoring arthrokinematics. The sustained glide causes stretching of rotator cuff interval causing translation of humeral head, resulting in increase in range of motion. The neuro physiologic effect is based on stimulation of peripheral mechanoreceptors and inhibition of nociceptors. Now a days along with mobilization many other techniques are also used to give early recovery to patient and to relieve pain. In that now a days Kinesiotaping technique is used widely. Kinesiotaping was developed in 1990, by Kenzo Kase with intention to alleviate pain and improve healing of soft tissue. It is designed to mimic qualities of human skin. Method of healing is based on simple principle that body has built in healing mechanisms and help to positively influence their efficiency by removing barriers that impede them. These results in increase fluid flow through injured area, better control over muscle contraction and fasten healing. Kinesiotaping can be helpful in improving pain free ranges immediately after application of tape and so helps in reducing disability. Kinesiotape allows movements with corrected scapular alignment during shoulder movement improves glenohumeral motion and reduces micro trauma and mechanical irritation of soft tissue structures and shoulder movements through arc of improved glenohumeral motion.

While applying k-tape muscle stretch is given so it was hypothesized that through prolonged stress relaxation and viscoelastic deformation will occur over period of time which will increase tissue extensibility. This increased extensibility can increase number of sarcomeres as adaptive change which will rearrange the collagen and will increase mobility of joint. There is increase in range of motion after application of Kt in which two mechanisms were explained for increased range of motion, first was the proponents of kinesiotape state that the tape convolution areas may increase the flow of blood and lymphatic fluids due to a lifting effect, which creates a wider space between the skin and the muscle and interstitial space, The possible increase in blood circulation to affect muscle functions. The second was stimulation of cutaneous mechanoreceptor which activates nerve impulses when mechanical load which include touch, pressure, vibration, stretch which create deformation. This activation of cutaneous mechanoreceptors by adequate stimulus causes local depolarization that trigger nerve impulse along afferent fiber travelling towards central nervous system mechanoreceptors. Kaltenborn mobilization improves shoulder range of motion in adhesive capsulitis. Some studies have shown that kinesiotaping and conventional exercise program is also effective on adhesive capsulitis.

The SPADI scoring method is short, easy to understand and takes less than five minutes to complete and score. This is a valuable attribute for time poor clinicians. It also has reasonably good clinimetric properties so the clinician can be sure that the scores that are obtained are an accurate reflection of the patient's state. If the measurement of pain and disability are of primary interest, the SPADI is a useful tool for a wide range of patients with most shoulder problems.

METHODOLOGY

The experimental study design in Pre and post-test experimental in nature. The study was conducted in out patients department of physiotherapy in cherran's institute of health science . A total number of 15 subjects were selected for this study in randomised control method by who fulfilled the inclusion criteria for this study. The following Inclusion criteria was used select the patients for this study.

The inclusion are Age 40-65 years, Both genders, Individuals with restriction of movements in capsular pattern, Subacute stage of adhesive capsulitis, Patients with minimum of grade 3 muscle strength. And the Exclusion criteria are History of shoulder dislocation, Shoulder fractures(in past 1 year), Concomitant cervical spine symptoms, Past shoulder surgery, History of neurological condition (e.g.: stroke, Parkinson's), Individuals with hypersensitivity to tape, Individuals with uncontrolled diabetes. The treatment protocol of kinesiotaping and kaltenborn mobilization were given. The treatment duration were given for the period of 3 days per week given for 4 weeks. The pre and post test values of treatment was taken by using the Shoulder Pain And Disability Index scale (SPADI).

PROCEDURE:

KALTENBORN MOBILISATION

GH caudal glide (for abduction)

Patient position: supine with arm in resting position and support the forearm between trunk and elbow.

Resting position: shoulder abducted 55 , horizontally adducted 30 and rotated so forearm was in horizontal position.

Hand placement: One hand of therapist will be near axilla to provide grade 1 distraction and web space of mobilizing hand was just distal to acromion process. The mobilizing force was applied in inferior direction and parallel to treatment plane.

Progression of caudal glide (for shoulder near 90degree)

Patient position: supine with arm abducted to the end of its available range. External rotation of humerus was added to end range position as arm approached beyond 90 degree

Hand placement: stand facing patient's feet and stabilize patient's arm against therapist trunk with hand far from patient. Web spaces of other hand was placed just distal to acromion process on proximal humerus. And humerus was glided in inferior direction.

To increase abduction (beyond 90 degree)

Patient position: in sitting with resting position of shoulder abducted and externally rotated to the end of its available range.

Hand placement: same as for progression of caudal glide. One hand grasping elbow applies distraction. Mobilizing force was with hand on proximal humerus, glide humerus in progressively antero-inferior folds of capsule in axilla.

GH posterior glide (for flexion and internal rotation)

Patient position: Supine with arm in resting position.

Hand placement: Therapist will stand between the patient trunk and arm. Support the arm against trunk of therapist grasping distal arm with lateral hand to provide grade 2 distractions. And place lateral border of other hand just distal to anterior margin of joint with fingers pointing superiorly. Humeral head was glided posteriorly by moving entire arm as you bend knees.

The mobilizing force was in posterior direction and perpendicular to treatment plane.

Progression of posterior glide

Patient position: supine with shoulder 90 degree flexed, internally rotated and with elbow flexed.

Hand placement: Towel padding was placed under scapula for stabilization. One hand of therapist across the proximal surface of humerus to apply grade I distraction. Other hand was over patient's elbow. Humerus was glided posteriorly by pushing down at elbow through long axis of humerus.

GH Anterior Glide (For External Rotation And Extension)

Patient position: prone with arm in resting position over edge of treatment table supporting on therapist thigh .stabilize acromion with padding.

Hand placement: therapist was in forward stride position. Supporting patient's arm against therapist thigh. Ulnar border of hand was placed just distal to posterior to acromion process with fingers pointing superiorly .Gliding humerus in anterior and slight medial direction. Grade I distraction were given to all patients. Then grade II mobilization were given and as per the patients progress it was progressed to grade III. The stretch is held for five to seven seconds and slowly released back. The procedure is repeated for 3-4 times at 3-4 sec of intervals. Further after two weeks procedure is repeated for 5-6 times. Duration - 30min duration will be taken for per session. Frequency - Each session will be done 3 times / week.



KINESIOTAPING :

The skin should be free of oils and lotions and should be cleaned prior to tape application. To remove tape from patients skin much easier to do when tape is wet Best to remove from top to down in direction of body hair and should limit discomfort Lift tape from skin applying tension between skin and tape then push skin away from tape rather than pulling tape away from skin. Patient can wear tape for several days and can be worn while bathing or swimming. The tape does not have to be removed if it has become wet only towel off excessive moisture and allow to air dry.

Application of tape Kinesio tape was applied for deltoid and supraspinatus in muscle technique and scapular taping was done in corrective technique.

Muscle technique For Supraspinatus

Patient in sitting with neck lateral flexed position and arm was adducted and internally rotated. Y shaped strip of tape was used base is just below the greater tubercle of humerus.

One tail of that tape was applied superior to spinous process of scapula end in supraspinous fossa and other tail along the spinous process of scapula.

For Deltoid

It was applied from insertion to origin and Y shaped strip was used. Patient in sitting position

The base of kinesiotape Y strip was 2 inches below the deltoid tuberosity of humerus with no tension. For anterior deltoid one strip was applied with patients arm in horizontal abduction and external rotation and horizontal extension, For posterior deltoid another strip is applied with patients arm maintaining adduction horizontal flexion and internal rotation.

Scapular taping

Scapula was taped in corrective technique. Patient in standing position. Base of tape was between interscapular region and patient was asked to retract shoulder and both the ends were applied. Tape was applied twice week. For 4 weeks.

DATA ANALYSIS

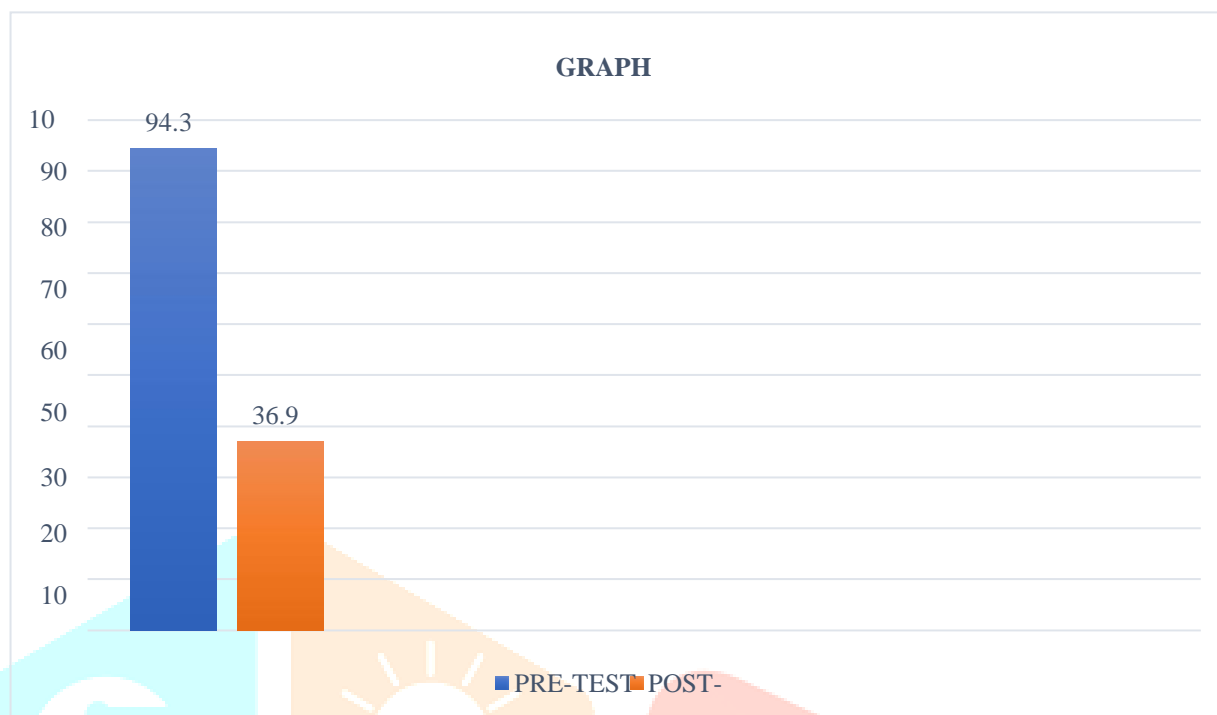
The parameters were assessed in experimental group having 15 subjects. The pre-test and post-test assessments were taken subjects with the uses of SPADI . The samples were assessed initially and then again at the end of the 4th week. Statistical analysis using patients parameters to calculate t value.

The mean difference of SPADI scale values were calculated in the experimental group.

PRE-TEST	POST-TEST	MEAN	SD	t	P value at 0.05 level
94.35	36.99	8.67	1.1	30.4	<0.0001

The above table shows that out of 15 samples, pre-test and post-test mean, mean difference, standard deviation, “t” value of sub-acute capsulitis in subjects. Calculated t value > table t value. P value is significant at the level of 0.05

GRAPH :



RESULTS

A total number of 15 subjects were age group between 40- 65 years with subacute adhesive capsulitis are randomly selected for this study. There were a group of subjects in experimental. The subjects of this group are given treatment for a period of 4 weeks. Before and after the treatment the subjects with pain and disability were measured using Shoulder pain and disability index (SPADI) for taking pre-test and post-test values respectively. The t value is calculated by the pre-test and post-test values of SPADI. Based on the statistical analysis the result of the present study shows that there is a significant improvement in the subjects with subacute adhesive capsulitis of shoulder following the effect of treatment. The paired “t” test was used to compare the pre-test and post-test values of the subjects. SPADI scale shows the Pre-test value of 94.35 and post-test value of 36.99. The t-value is 30.4. The standard deviation is 1.1. The mean difference is 8.67.

Based on the statistical analysis, the result of the present study shows that there is remarkable improvement $p < 0.0001$ following the effectiveness of kinesiotaping along with kaltenborn mobilization in patients with subacute adhesive capsulitis.

By the values of statistical analysis of the study show that kinesiotaping along with kaltenborn mobilization is effective for disability and relief in subacute adhesive capsulitis of shoulder joint.

DISCUSSION

The purpose of this study is to analyse the effectiveness of mobilization technique along with the kinesio taping with shoulder exercise for reducing pain and disability for sub acute periartthritis of shoulder patients. The treatment session were given 3 days per week given for 4 weeks.

Neviaser RJ - conclude that the The main aim of joint mobilization is to restore the normal joint play that might have been compromised by damage or injury Frozen shoulder syndrome is condition of uncertain etiology characterized by a progressive loss of both active and passive shoulder motion Clinical syndrome includes pain and limited range of motion a limited range of motion and muscle weakness from disuse

In this study we have analysed effectiveness of mobilization technique along with the kinesio taping with shoulder exercise for reducing pain and disability for sub acute peri-arthritis of shoulder patients. Before the treatment session the pre-test SPADI (Shoulder pain disability index) measured and after 4 weeks of treatment the post-test values of shoulder pain scale are measured. The paired t test was used to compare the pre-test and post value of SPADI for subjects. There is a significant improvement in functional ability and re-education pain in subjects.

CONCLUSION

An experimental study to analysis the effectiveness of kinesiotaping along with kaltenborn mobilization technique on pain and disability in subjects with subacute adhesive capsulitis. Fifteen subjects were selected for this study in simple random sampling manner. Pain disability was measured using SPADI. This study support the alternative hypothesis. The analysis of the study concluded that the subjects who received the kinesiotaping along with kaltenborn mobilization technique has reduced pain and improved functional disability that was due to peri-arthritis shoulder. The statically result show that improvement in subjects

LIMITATIONS

- The study was short term and therefore to make it more valid long term is necessary.
- The study was limited with specific age group 40- 65 years.
- Since this study had been done with smaller number of subjects,
- Certain factors such as psychological status good not control during the period of study

RECOMMENDATIONS

- Future study should focus on other manual technique along with kinesiotaping which decrease the disability and pain in subacute adhesive capsulitis of shoulder.
- Kinesiotaping to different muscles like lower trapezius, serratus can be applied to see the effect.
- Similar study can be done with longer duration.
- Similar study can be done with other age group
- Simple study can be done with more numbers of subjects outcomes

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