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Effects of Move Kinetic Taping in Rehabilitation of Shoulder Abduction Dysfunction Syndrome

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Abstract

Objective: To compare the effects of move kinetic taping intervention on shoulder range of motion and pain in subjects with shoulder abduction dysfunction syndrome over conventional physical therapy for the shoulder.

Design: Experimental study.

Setting: Yesodha physiotherapy center, Coimbatore, India AHCC Mumbai, India.

Participants: A total of 40 participants were recruited: 20 subjects in each group (experimental group I and II include males and females) with shoulder abduction dysfunction syndrome of the shoulder complex.

Intervention: Experimental group I- Using the move kinetic taping based on the myofascial sequence was applied over the shoulder followed by corrective exercises. Experimental group II- conventional Physical Therapy as indicated for pain and stiffness followed by corrective exercises.

Main outcome measures: Pain score and shoulder abduction range of motion score.

Results: A significant increase in shoulder abduction range of motion and pain relief was observed in both groups.

Conclusion: Individuals with shoulder abduction dysfunction syndrome of the shoulder are able to demonstrate immediate beneficial adaptations to move kinetic taping (menthol infused) based on the myofascial sequence which incorporates the dermo neuro modulation and fascial biomechanics and neurophysiology. This is important as it can effectively be used in pain relief after which the follow up strengthening exercise program is executable.

Keywords: Move kinetic taping; Rehabilitation; Shoulder abduction dysfunction syndrome; Humerus

Introduction

Shoulder abduction dysfunction syndrome is due to movement impairment defined biomechanically as either lack of excessive medial glide of humerus or the excessive superior glide in the humerus.

Excessive medial glide of humerus

Excessive humeral medial rotation or insufficient lateral rotation is noted during shoulder flexion and abduction. The shoulder medial rotators dominate over the lateral rotators.

- Pain most often in anterior shoulder but may also be posterior shoulder or deltoid area.
- Pain with overhead activities or with activities involving shoulder rotation arm elevated.
- Unable to sleep on affected side.

Excessive superior glide in the humerus

Excessive superior or insufficient inferior glide of the humeral head is noted during shoulder motions. This may be associated with stiffness or shortness of the superior or inferior structures of the GH joint. Insufficiency of the rotator cuff because of weakness, recruitment impairments, or tear is a major causative factor. This disrupts the normal force couple between the rotator cuff and the deltoid.

- Pain in superior, anterior or posterior shoulder or deltoid area.
- Pain with overhead activities or reaching out to the side.
- Unable to sleep on affected side.
- More common in middle aged to older people.

Associated diagnosis

- Rotator cuff tendinopathy
- Shoulder impingement
- Partial or complete rotator cuff tear
- Bicipital tendinopathy
- Supraspinatus tendinopathy or tear
- Humeral subluxation
- Bursitis
- AC joint pain
- Calcific tendinopathy
- Frozen shoulder and adhesive capsulitis
- Outlet syndrome

Musculoskeletal pain problems, is that slight alterations in the accuracy of movement cause micro trauma and, if permitted to continue, will cause macro trauma and pain. These adaptations in the accuracy of movement result in the progress of compensatory

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movements that occur in specific directions and can be categorized as movement impairments. The contributing factors to these movement impairments are changes in muscle length, strength, stiffness, and patterns of participation that arise from repeated movements and sustained postures.

Classical anatomy still do not recognize fascia and its role. However, different concepts relating to the function of this tough tissue have led to the conception of several soft tissue techniques for the treatment of musculoskeletal pain. This paper presents a study with reference to the application of one such technique with move kinetic taping incorporating neurophysiological model and fascial biomechanics in 20 subjects suffering from shoulder abduction dysfunction syndrome.

Since the movement in shoulder is accomplished by the neural command and the peripheral neuro musculoskeletal system coordinated activity of the musculoskeletal system embedded by the fascia. The fasciae of the arms are subjected to different functional demands from the fasciae of the pectoral girdle. The influence of gravity on the pectoral girdle is cushioned by a dynamic visceral cavity and the curvatures of the back. Such a dynamic is lacking within the arm: there is no buffer within this extremity like the visceral cavity, while the respiratory motion acts only as a minimal rotational force on the tissue without causing a significant change in the position of the arm. Let us regard these circumstances in relation to our central working hypothesis, which is that fasciae and membranes change their appearance according to their functional context. As soon as repetitive sequences of movement occur, the fibers realign themselves correspondingly and regulate the distribution of components with high and low fluid contents. The dominant functions of the arms are flexion and extension and the interplay between those two functions. This is clearly reflected in the layers of the fasciae of the upper arm and forearm. Here, there are none of the flat sliding layers as can be found in the pectoral girdle. Instead, there are deep membranes that form individual osteofibrous canals for flexors and extensors, respectively.

In most day-to-day activities, the flexion movement of the forearm and the extension movement of the hand are dominant. So, in people who perform a manual activity, we usually find a lack of equilibrium in the joints of the arm between the prevailing tone of the flexors and the tone of the extensors. The resting tension of the flexors is elevated in comparison with the resting tension of the extensors. The fasciae of the flexor musculature are subjected to different forces than those of the extensor musculature. Because these fasciae have a direct connection to the intramuscular septa and interosseus membranes, this lack of equilibrium between flexors and extensors also has an effect within the membrane structure of the osteofibrous canals. Function of the arms may be traced back to this fact. At some point, the lack of equilibrium between the tone of the flexor and extensor musculature is present not only in the fascial layer of the arm, but also in the deep membranes. In advanced stages, the deep membranes have a higher fiber density and fewer elastic components than the superficial layers, which can no longer be solved with muscle-building and equalizing activity. Faced with this situation, we must rely on a detailed treatment strategy that allows the musculature to gain a new range of action by treating the deep membrane layers. A rotator cuff injury is a tear or inflammation of the rotator cuff tendons in the shoulder.

Fine adjustments of the humeral head within the glenoid are achived by co- ordinated activity of four interrelated muscles arising from the scapula and called as the rotator cuff. Rotator cuff muscles are supraspinatus, infraspinatus, teres minor and subscapular is shoulder abduction dysfunction syndrome is known by several names, including pitcher's shoulder, swimmer's shoulder, rotator cuff dysfunction and tennis shoulder. As the names imply, the injury occurs most frequently in athlete practicing sports that require the arm to be move over the head repeatedly. Such as pitching, swimming, tennis and weight lifting. Rotator cuff disease is a common an important source of shoulder problems. The cuff mechanism functions not only stabilize the shoulder but also to provide power for movement. The pathogenesis of rotator cuff dysfunction is associated trauma, overuse, and aging. Also it occurs fall on outstretch hand. The supraspinatus and infraspinatus are most commonly involved.

The causes in non-sports persons are age > 40 years, occupation requiring repetitive and excessive overhead movements, overhead sports and athletes like throwers, swimmers, tennis players etc. Degenerative causes is the major cause. Dislocation of the shoulder joint in 40-60 years of age. Above 2/3rd causes are seen in males.

According to American arthroscopic orthopaedics the rotator cuff tear classified the as small tear (<1 cm), medium tears (1-3 cm), large tears (3-5 cm). The symptoms are pain, swelling, limitation of shoulder movements, muscle atrophy, tenderness over the greater tuberosity, difficulty in carrying out the shoulder movements and especially abduction. The special tests are used to confirm the rotator cuff tear is drop arm test. The common conservative managements are local infiltration of hydrocortisone, sub acromial steroid injections, heat massage, analgesics, anti-inflammatory medication, active and passive exercises, and temporary immobilization. The common surgical treatments are arthroscopic repair for small and medium tear, open methods in major tears. Shoulder Abduction Dysfunction Syndrome was reported in 1852. In 1972, Charles Neer proposed that Impingement was due the anterior third of the acromian and the coracoacromial ligament and suggested surgeries focused on these areas.

The International Association defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. Pain messages are two-way traffic. Inhibitory effects are achieved through the descending pathways, which reach from the conscious brain down to the gates in the subconscious brain and the spinal cord. The reason for this is that the gates are places where the flow of pain messages can be controlled or influenced. By sending responses back to the periphery, the brain can ordered to release of chemicals that have analgesic effects, which can reduces, inhibit pain sensation.

The Rotator cuff consists of four muscular and tendons that cover the head of the humerus and attach it to the shoulder blade or scapula. They provide strength and stability during rotational movements in the arm, Shoulder Impingement or abduction dysfunction Syndrome refers to mechanical compression or inflammation of the rotator cuff tendons. This occurs when the space of the shoulder joint narrows and the rotator cuff tendons or bursa lubricating sacs located over the rotator cuff, become compressed, irritated or damaged resulting in pain, inflammation and reduced mobility.

In dependent arm position mechanism for stabilization of the arm when relaxed at the side, the dislocation effect of gravity is counteracted by passive tension in the superior joint capsule and in the coracohumeral ligament. The musculature surrounding the shoulder joint is arranged to produce large stability components of the muscles forces. The muscles called rotator cuff muscles. This is only when weight is acting. During abduction SSP tendon pushed into acromion process and coracoacromial ligament. During rotation SSP tendon dragged along the inferior surface of the acromian processes.

Overhead activities of the shoulder especially repeated activity is a risk factor for shoulder abduction dysfunction syndrome. Some examples are painting, lifting, Swimming, Tennis and other overhead activities. In this syndrome pain persists and affect every day activities. Motions such as reaching up behind the back or reaching up overhead to put on coat or blouse for e.g., may cause pain. Main symptoms in SAS is pain, weakness and loss of movement on the affected side.

Neviaser and Nevasier drop arm test says that palm down abduction smoothly and sustain abduction against minimal resistance is not sustained the test is positive, implicating a supraspinatus tendon or rotator cuff tear. According to Neer and Welsh procedure impingement pain by forceful elevation is flexion of humerus which forces the rotator cuff tissue into the anterior third of acromian and when pain eliminated by 10ml lidocaine injection into the joint.

As per Hawkins and Kennedy test the pain is better reproduced by 90% of humeral flexion with forceful internal rotation which drives the rotator cuff tissues under the coracoacromial ligament. Impingement syndrome test says that if passive compression of greater tuberosity against the coracoacromial ligament or acromian reproduce the pain, the test is positive implicating bicipital or supraspinatus tendon or subacromial bursa pathology.

Yergason test resulted elbow flexion and shoulders medial rotation reproduce pain or snapping in the anterior upper arm the test is positive implicating instability of long head of biceps tendon in the bicipital groove. According Subacromial compression test the evaluator positioned one hand over the acromian of the scapula for stabilization. The other hand positioned on the ulnar proximal forearm. The arm was passively elevated into the stabilized acromian. Then elbow flexed to 900 and forearm is relaxed, palm down position. Once elevated, the arm was moved anteriorly and posteriorly in the horizontal plane attempting to compress all regions of the subacromial joint there by reproduce pain.

Fascial compartments of the upper limb

The upper limb in generally divided into compartments. The compartments of interest in our shoulder abduction dysfunction syndrome will be anterior, lateral and extraroation.

The anterior compartment: The antepulsion sequence fascial compartment.

At the level of shoulder/humerus contains the clavicular portion of pectoralis major, deltoid anterior fibers and short head of biceps.

At the level of elbow contains biceps brachii and the brachials.

At the level of wrist contains the flexor carpi radialis, palmaris longus and flexor pollicis longus.

At the level of thumb contains muscles of thenar eminence.

The lateral compartment: The Latero pulsion sequence fascial compartment.

At the level of shoulder/humerus contains the lateral deltoid, long head biceps, serratus and supraspinatus.

At the level of elbow contains brachioradialis, extensorcarpiradialis longus and brevis.

At the level of wrist contains abductor pollicis, extensorcarpiradialis longus and brevis.

At the level of thumb first dorsal interossei, abductor pollicis longus and extensor indicis.

The posterior lateral compartment:

The extra rotation sequence fascial compartment: At the level of shoulder/humerus contains the infraspinatus, teres minor and supraspinatus.

At the level of elbow contains supinator, biceps brachi, brachioradialis.

At the level of wrist contains extensor digitorum, abductor pollicis longus, and extensor pollicis longus.

At the level of thumb contains extensor digitorum.

Statement of the problem: To compare the effectiveness of conventional shoulder rehabilitation and role of move kinetic taping for SADS in the management of pain and range of motion among SADS shoulder abduction dysfunction syndrome subjects.

Need of the study: Shoulder abduction dysfunction syndrome is a most common clinical condition and its complex etiology is not yet fully understood. These are systematic reviews reporting the effectiveness taping therapy for the treatment of shoulder movement dysfunction. The aim of the study is to determine the efficacy of Move kinetic taping procedure in subjects with shoulder abduction dysfunction syndrome.

Objectives of the study: To study the effects of conventional shoulder rehabilitation devoid of taping on pain and ROM among shoulder abduction dysfunction syndrome subjects. To study the effects move kinetic taping procedure for SADS on pain and range of motion among shoulder abduction dysfunction syndrome subjects. To compare the effects of conventional shoulder rehabilitation and move kinetic taping procedure on pain and ROM among shoulder abduction dysfunction syndrome subjects.

Hypotheses

- It is hypothesized that there may be significant difference in pain and range of motion following conventional shoulder rehabilitation among shoulder abduction dysfunction syndrome subjects.
- It is hypothesized that there may be significant difference in pain and range of motion following move kinetic taping procedure techniques among shoulder abduction dysfunction syndrome.
- It is hypothesized that there may not be significant difference between conventional shoulder rehabilitation and move kinetic taping for SADS in reducing pain and increasing range of motion among shoulder abduction dysfunction syndrome subjects.

Operational definitions

Assess: It refers to the systematically and continuously collecting and validating data of shoulder abduction dysfunction syndrome subjects regarding conventional shoulder rehabilitation and neuromuscular re-abilitation.

Effectiveness: It refers to the outcome of the conventional shoulder rehabilitation and neuromuscular re-abilitation on pain and range of motion among shoulder abduction syndrome subjects. It is measured in terms of the difference between the effectiveness of conventional shoulder rehabilitation and neuromuscular re-abilitation.

Pain: Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms in such damage.

Acute pain: Acute pain links an unpleasant sensory, perceptual,

emotional and Mental experience provoked by acute disease or injury with autonomic psychological and behavioural responses.

Chronic pain: Chronic pain can be defined as persistent pain that lasts beyond the expected time frame for tissue healing chronic pain leads itself to behavioural and / or emotional interpretations and is a multifaceted problem.

Range of motion: It is the Linear or angular distance that a movable object- may normally travel while properly attached to another.

Shoulder abduction dysfunction syndrome: Shoulder abduction dysfunction syndrome is commonly described as a condition characterized by excessive repetitive contact between the posterior aspect of the greater tuberosity of the humeral head and the posterior superior aspect of the glenoid rim when the arm is placed in extreme ranges of abduction and external rotation. This ultimately leads to impingement of the rotator cuff tendons (supraspinates/infraspinators) and the glenoid labrum.

Move kinetic taping: Move kinetic taping originates in the science of movement, based on the belief that the body's muscles are responsible for the movements of and in the body as well as being in control of other elements, such as circulation of the blood and body temperature. As a result of this, when muscles fail or are impaired other parts of the body are necessarily effected, thus putting their function at risk. The principle of Move Kinetic Tape is to treat the muscles to help the body heal itself naturally.

Move kinetic taping is rehabilitation cum protective use of stretchable Move Kinetic tapes to provide reduction of pain, enhancing performance, preventing injuries, support to the joints, repositioning of structure as well as for fascial and ligamentous correction. It facilitate the healing process while providing full range of motion with support to the joints supportive structures as well as providing mobilization effects.

Move kinetic tapes is a first tape in world to be formed by Menthol, Borneal, Arnica and 98% acrylic glue, which is a hypo allergic substance making it suitable for application to all the individuals. The acrylic glue is masked on the tape in a fixed sine wave pattern. The cotton tape is woven such like that it can only be stretched in a particular longitudinal direction, and not in a transverse direction, this specific acrylic design helps in using the tape to increase or decrease the muscle tone as well as for functional correction, The energy stored in the tape on stretching is only used in one direction, which decreases the wasting of energy. When the tape is stretched it stores the potential energy, now due to its ability to stretch and recoil in longitudinal manner, all the potential energy is used in a specific direction, minimizing the energy loss as well as increasing the efficacy of the tapes.

Methodology

Study setting

The study setting was conducted in R.V.S.college of physiotherapy OPD, Yesodha physiotherapy center Coimbatore and Asian Health Care center Mumbai.

Selection of subjects

Twenty (20) subjects with SADS fulfilling the inclusion criteria were selected for the study. The subjects were randomly assigned into two groups. Experimental group I and experimental group II.

- Experimental group I received Conventional shoulder rehabilitation (electrotherapy and mobilization techniques) devoid of taping.
- Experimental group II received move kinetic taping for SADS.

Variables

Dependent variables: Dependent variables are pain andd range of motion.

Independent variables: Conventional shoulder rehabilitation (ultrasound therapy and mobilization) move kinetic taping.

Measurement tools: The measurement tools are represented in Table 1.

Visual analog scale: The visual analog sacle is shown in Table 2.

Functional assessment scale:

- Reaching external occipital protruberance A B C.
- Reaching overhead 135˚ A B C.
- Reaching Spinous Process:

Where A-can do; B-can do with pain; C-cannot do

Method: Independent t-test performance stanely and Campbell notation for the study design is:

$\mathbf{O\ X_1\ O}$

$\mathbf{O\ X_2\ O}$

Where;

O- Observation

X_{1-} Patient devoid of neuromuscular re-abilitation and treated with ultrasound therapy and mobilization.

X_{2-} Patient treated with neuromuscular re-abilitation.

Paired t- test is done for experimental group I and experimental group II.

Unpaired t-test is done to find the significance of experimental group II over experimental group.

Study design: Pretest and posttest experimental design.

Study duration: 3 months.

Inclusion criteria

- Clinically diagnosed shoulder abduction dysfunction syndrome subjects.
- Age group between 20-40 years.
- Sex both male and female were included in the study.

Variables	Tools
Pain	Visual Analog scale (VAS)
Range of motion	Goniometry
Functional assessment scale	

Table 1: Measurement tools.

0-40% (Least Pain)	40-60%	60-80%	80-100% (MaxPain)

Table 2: Visual analog scale.

Exclusion criteria

- History of capsular, ligament, tendon and labrum injuries.
- Any recent surgery in and around shoulder joint.
- Acromio clavicular joint arthritis etc.
- Advanced calcified tendinitis.

Orientation to the subjects

Before collection of the data subjects were explained about the purpose of the study. The investigator had given a detailed orientation to the various test procedures such as VAS and ROM measuring scales. The concern and full co-operation of each participant was sought after complete explanation of the condition and demonstration of the procedures involved in the study.

Materials used:

- Data collection sheet
- Client consent form
- Treatment couch
- Supportive aid
- Electrotherapy
- Pillows and sheets
- Move kinetic tape, scissors

Test administration

Pain assessment by VAS: The visual analogue scale is one of the most common and reliable pain intensity assessment tools. It is a self-reported measurement consisting of a horizontal line with extreme anchors of no pain to the worst pain. The horizontal line represents a continuum of pain intensity and is 10 cm long. The subjects were asked to mark on the line at a right angle at a point which represents his current level of pain. The distance in centimeters from the lower end of VAS to the subject's mark was used as a numerical index of the severity of pain.

Goniometry: Goniometry is one of the most common and reliable assessment tool used for improving range of motion. It can be done by active and passive range of motion which includes flexion, abduction, internal rotation and external rotation.

Procedure/conventional shoulder rehabilitation: Ultrasound is also prevalent in research. Studies have used ultrasound in concert with therapeutic exercise to treat shoulder abduction dysfunction syndrome and have concluded that pain scores improved in both groups and thus findings suggest that intermittent ultrasound added to conservative treatment of shoulder adduction dysfunction syndrome does not provide an additional benefit to the patients.

Procedure/ move kinetic taping of shoulder abduction dysfunction syndrome

Patient position: The patient is sitting in relaxed comfortable position without any back support.

Procedure: A Y strip is used for taping the supraspinatus muscle. MOVE DOWN technique is used. The MOVE POINT is placed at the superior facet of the greater tubercle of humerus with no stretch. The first wing of the 'Y' strip goes above the spine of the scapula while the second wing runs on the spine of the scapula. 25% stretch is applied to the tape. The MOVE END is applied at the supraspinous fossa of scapula with no stretch. Second, a 'Y' strip is used to tape the Infraspinatus muscle. MOVE DOWN technique is used. The MOVE POINT is placed just inferior to the move point of the supraspinatus muscle i.e., at the middle facet of the greater tubercle of the humerus with no stretch. The first wing of the 'Y' strip goes below the spine of the scapula while the second wing runs inferior to the first wing. 25% stretch is applied to the tape. The MOVE END is applied at the Infraspinous fossa of the scapula with no stretch (Figure 1).

Collection of data

Twenty selected subjects with Shoulder abduction dysfunction syndrome were divided into two groups:

Group I- received conventional shoulder rehabilitation (ultrasound and mobilization). Group II – move kinetic taping for SADS. The treatment intervention for both the experimental group I consist of sessions 5 per week, each lasting 30 minutes for a total of 10 treatment sessions over 2 consecutive weeks followed with corrective exercise as pain decreased by 50%. The treatment intervention for both the experimental group II consist of one session of taping per week, for a total of maximum three taping sessions over 2 consecutive weeks followed with corrective exercise as pain decreased by 50%. Before and after completion of 2 weeks treatment intervention pain and range of motion were evaluated by visual analogue scale and goniometry respectively and recorded.

Statistical techniques

The collected data were analyzed by paired' test to find out significant difference between pre and post-test values of group I and II and further unpaired 't' test was applied to find out the differences between groups (Table 3).

Results

Data interpretation

Pain: There was significant decrease in pain in the both the groups as observed. The experimental group 1 showed a mean decreased of

Figure 1: Move kinetic taping of shoulder abduction dysfunction syndrome.

37.5 ± 8.1%while experimental group II showed greater decrease at 52.5 9.4%. The t- values calculated to compare them showed a value of 13.86 at p=0.05 (Table 4).

Based on the unpaired t-test performed for five variables in pre test and post test experimental groups design, we conclude that there is a significant improvements in the symptomatology and increase of functional activities. The improvement shown by the patients treated with move kinetic taping is statistically significant as compared with conventional shoulder rehabilitation among shoulder abduction dysfunction syndrome.

Hence the hypothesis is accepted. So move kinetic taping is found to be effective in the overall rehabilitation of shoulder abduction dysfunction syndrome.

Range of motion

Flexion: The experimental group I had a mean improvement of 16.7 ± 6.67 while the experimental group II showed 38.8 ± 6.47 improvement. The t-test performed between them showed highly significant figures with t=17.23 at p=0.05 (Figures 2 and 3).

Abduction: Here the experimental group I had an improvement of 54.75 ± 10.81 as against the experimental group II improvement of 72.8 ± 9.76. The t-test was performed and showed a t-value of 17.79 at p=0.05 (Figures 4 and 5).

Internal rotation and external rotation

Experimental group II showed greater improvement compared to experimental group I with 27.65 ± 4.94, 15.8 ± 7.47 respectively for internal rotation. The external rotation showed 27.65 5.97 for experimental group II and for experimental group I it showed only 23.5 ± 9.75. (Figures 6-9) The t values calculated showed 16.19 and 9.85 for internal and external rotations respectively which are statistically significant (Tables 5-7).

Discussion

A very high linearity in the improvement of the patients with Shoulder Abduction Dysfunction Syndrome in both conventional shoulder rehabilitation such as ultrasound therapy and mobilization with move kinetic taping procedure. However it can be seen that the magnitude of improvement in the experimental group II is high.

It is very important to consider and look out that there is also considerable improvement in conventional physiotherapy with

Variables	Experimental Group 1			Experimental Group 11		
	Pre-test mean	Post-test mean	Mean difference	Pre-test mean	Post-test mean	Mean difference
Flexion	128.5	145.2	16.7	120.4	159.2	38.8
Abduction	87.8	142.55	54.75	85.15	157.95	72.8
Internal Rotation	35.2	51	15.8	33.15	60.8	27.65
External Rotation	43	61.3	23.3	40.3	67.5	27.2

Table 3: Mean of pre and posttest level of range of motion between the groups.

Variables	Experimental Group 1			Experimental Group 11		
	Pre-test mean	Post-test mean	Mean difference	Pre-test mean	Post-test mean	Mean difference
Pain	76.5	39	37.5	79.5	27	52.5

Table 4: Mean of pre and post-test level of pain between the groups.

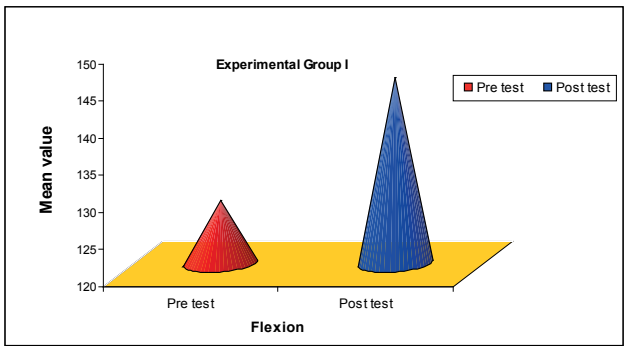

Figure 2: Flexion mean of pre and posttest level of range of motion between the group I.

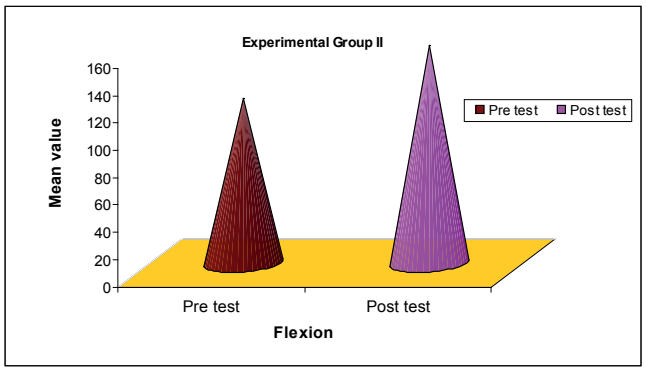

Figure 3: Flexion mean of pre and posttest level of range of motion between the group II.

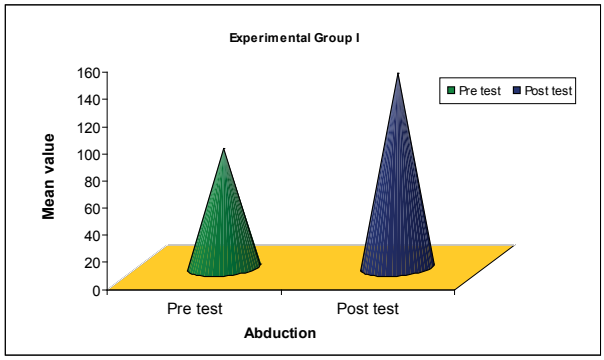

Figure 4: Abduction mean of pre and posttest level of range of motion between the group I.

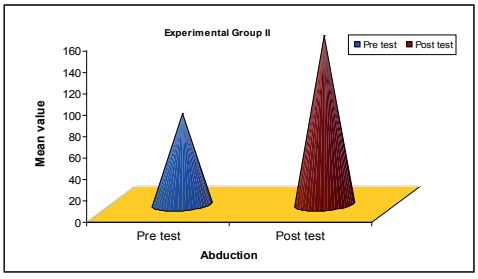

Figure 5: Abduction mean of pre and posttest level of range of motion between the group II.

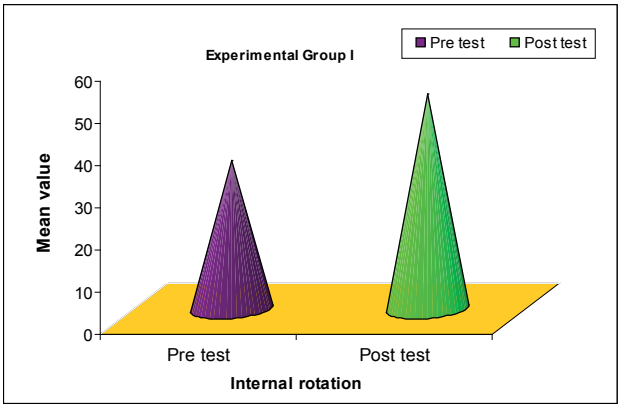

Figure 6: Internal rotation mean of pre and posttest level of range of motion between the group I.

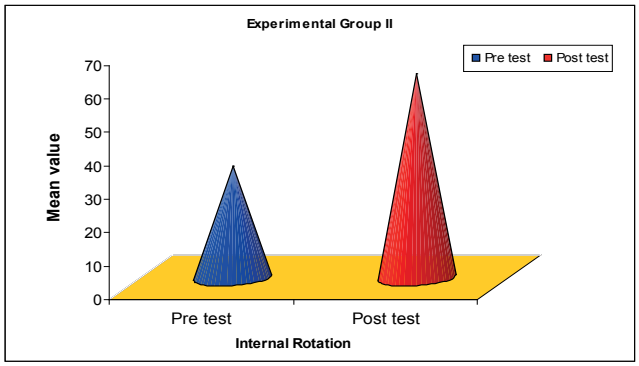

Figure 7: Internal rotation mean of pre and posttest level of range of motion between the group II.

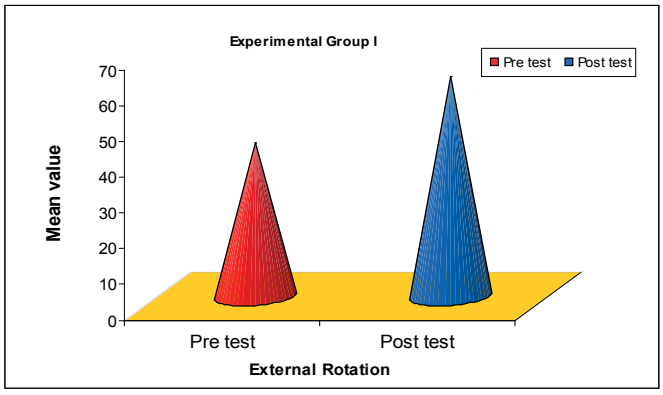

Figure 8: External rotation mean of pre and posttest level of range of motion between the group I.

ultrasound therapy but however the functional ranges does not go beyond 150˚. Hence the person reports to a physiotherapy that hamper his profession. The overhead activity accomplished in experimental group II with range increasing to as much as 175˚.

The internal rotation also seem to increase more in experimental group about 60˚ against 47˚ of control group. It is also reflected in the pattern of recovery of external rotation to about 80 plus degrees. This is conjunction with the literature review and it also seems that internal rotation is more than the external rotation.

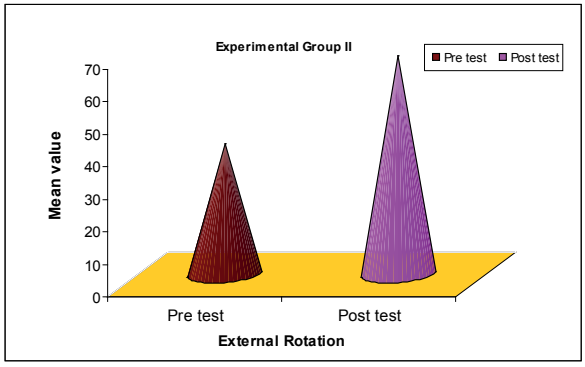

Figure 9: External rotation mean of pre and posttest level of range of motion between the group II.

S.no	Variables	Calculated t value for experimental group 1	Calculated t value for experimental group II
1	Flexion	17.77	31.83
2	Abduction	28.6	29.79
3	Internal Rotation	18.97	56.95
4	External Rotation	32.87	16.5
5	Pain	39.97	42.25

Table 5: Critical values of paired t test to find out the significant differences in pre and post test scores for both experimental group I and experimental group II.

S.No.	Variables	Calculated t value
1	Flexion	17.23
2	Abduction	17.79
3	Internal Rotation	17.19
4	External Rotation	9.85
5	Pain	13.86

Table 6: Critical values of unpaired t test to compare the effectiveness of experimental group I with experimental group II.

Variable	Experimental Group-I		Experimental Group-II	
	Pre-Rx	Post-Rx	Pre-Rx	Post-Rx
Reaching occipital protuberance can do	6	10	3	17
Can do with pain	10	7	6	2
Cannot do	4	3	11	1
Reaching over head 135° Can do	5	8	3	16
Can do with pain	10	9	7	3
Cannot do	5	3	10	1
Reaching spinous process can do	3	9	1	13
Can do with pain	10	6	6	5
Cannot do	7	5	13	2

Table 7: Significant differences in effectiveness of treatment between experimental group I and experimental group II.

The flexion movement also improved a lot and is also the significant movement that has to be considered functionally, Pain as a factor immediately after each session to ultrasound is far reduced but as a result with the functional recovery in concerned after the recovery from pain is much more reduced in experimental group II and the reason might be correction of the pathomechanics by incorporating the dermo neuro modulation and fascial biomechanics and neurophysiology.

Discussion on hypotheses

In hypothesis 1 the researcher stated that there might be significant difference in pain and range of motion following conventional shoulder rehabilitation among shoulder abduction dysfunction syndrome subjects. This study shows there is significant difference in pain and range of motion following conventional shoulder rehabilitation among shoulder abduction dysfunction syndrome subjects. Therefore the hypothesis was accepted. In Hypothesis 2 the researcher stated that there might be significant difference in pain and range of motion following move kinetic taping procedure among shoulder abduction dysfunction syndrome subjects. Kinesiotaping might serve as a method of management in shoulder impingement syndrome [1]. Kinesio taping was found to be effective on pain and function [2,3] kinesio taping seems to be better tolerated in the management of shoulder impingement and plays major role in conservative management [4,5]. Kinesio-Tape could provide a short-term alternative for patients with higher levels of kinesiophobia by decreasing fear and aiding in the patient's return to pre-injury levels of function and Kinesio-Tape may reduce pain in patients with musculoskeletal pain [6]. Kinesio taping as a noninvasive alternative as the first line of management especially in patients who require the immediate effect of treatment [7]. This study shows that there is significant difference in pain and range of motion following move kinetic taping procedure among shoulder abduction dysfunction syndrome subjects. Therefore, the hypothesis is accepted. In Hypothesis 3 the researcher stated that there might not be significant difference between conventional shoulder rehabilitation and move kinetic taping procedure in reducing pain and improving range of motion among shoulder abduction dysfunction syndrome subjects.

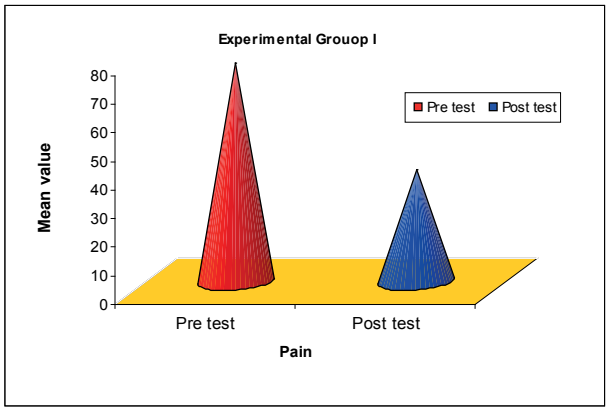

Figure 10: Mean of pre and post-test level of pain between the group I.

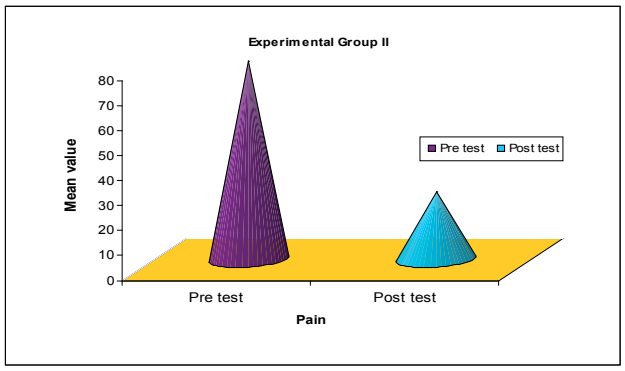

Figure 11: Mean of pre and post-test level of pain between the group I.

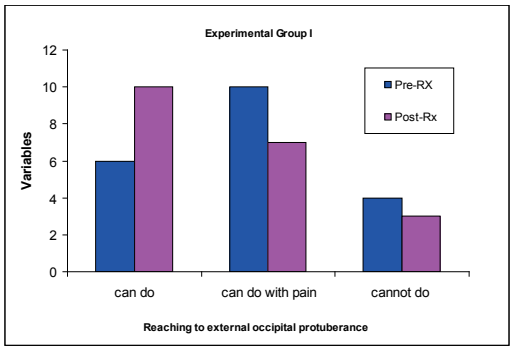

Figure 12: Reaching occipital protuberance, significant differences in effectiveness of treatment between experimental group I.

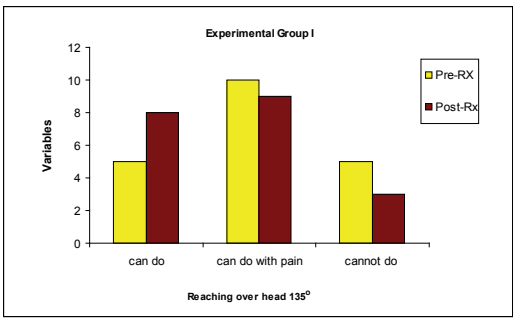

Figure 13: Reaching over head 135°, significant differences in effectiveness of treatment between experimental group I.

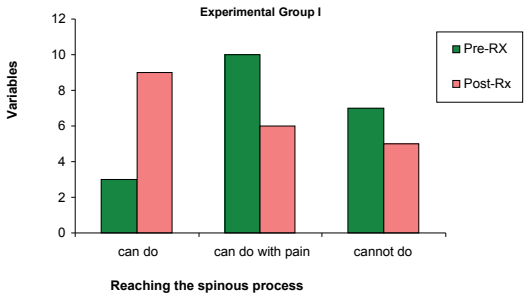

Figure 14: Reaching the spinous process, significant differences in effectiveness of treatment between experimental group I.

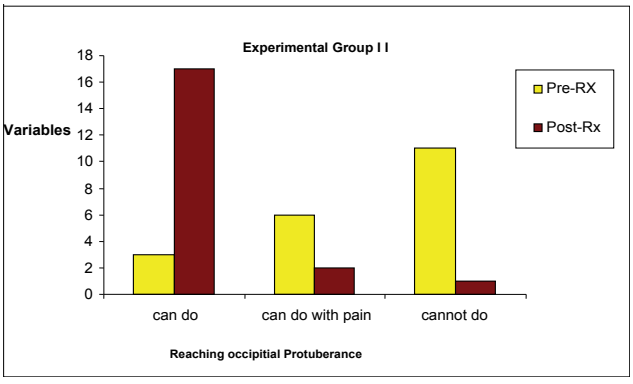

Figure 15: Reaching occipital protuberance, significant differences in effectiveness of treatment between experimental group II.

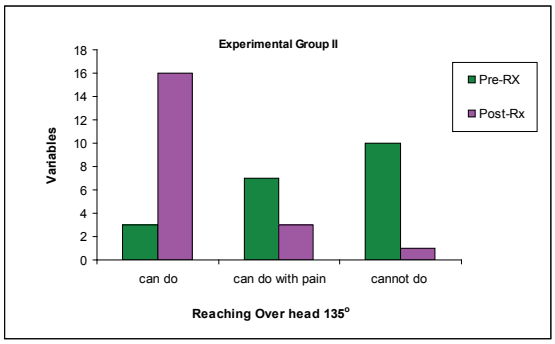

Figure 16: Reaching over head 135°, significant differences in effectiveness of treatment between experimental group II.

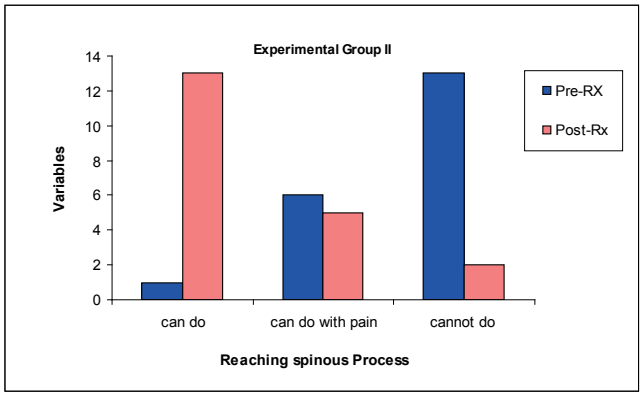

Figure 17: Reaching the spinous process, significant differences in effectiveness of treatment between experimental group II.

Conclusion

Twenty subjects with SADS were included in this study and randomly assigned in to two groups I and II with each group consisting of 20 subjects.

Group I was treated with conventional shoulder rehabilitation and Group II was treated with move kinetic taping, pain and range of motion were assessed before and after the intervention by Visual Analogue Scale (VAS) and goniometry respectively.The result showed that move kinetic taping procedure effective in decreasing pain and improving range of motion. Also conventional shoulder rehabilitation were effective in decreasing pain and improving range of motion.

When comparing conventional shoulder re-habilitation and move kinetic taping on pain the statistical result showed that there was no significant difference between both the groups, but when analyzing mean difference of both groups, group II received move kinetic taping procedure showed more difference than group I devoid of taping (Figures 10-17).

But when comparing conventional shoulder rehabilitation and neuromuscular re-abilitation on range of motion the statistical result showed that there was significant difference between both the groups. When analyzing mean difference of both groups, group II treated with move kinetic taping showed more difference than group I.

Hence we can conclude that move kinetic taping procedure for SADS was found to be more effective than conventional shoulder rehabilitation in reducing pain and improving range of motion among shoulder abduction dysfunction syndrome subjects.

Limitations

- Small population size.
- This study was a short term study.
- Occupations are not considered.

Suggestions

- Similar study can be carried out for larger sample size.
- Study can also be carried out for different age groups.
- Study can be done in different variables.
- Study can be done with more consistent outcome measures.
- Study can be done for a specific occupation.

The above table shows the difference in means of pre and post test score for both experimental group I and experimental group II.

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