THE EFFECT OF SHOULDER GIRDLE EXERCISES ON UPPER CROSS SYNDROME AMONG STUDENTS

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Abstract: **Subjects with upper cross syndrome who fulfilled the selection criteria were recruited in the study. This study include upper cross syndrome subjects who have posture with forward head and rounded shoulder, with CV angle range below 48 degree and Bournemouth questionnaire average about 15%, Age group of both gender 18 to 25 this study excluded subjects with any fractures over the neck and upper back region, inflammation/ any joint effusion, joint instability, recent injury/ significant pain, disease affecting the tissue being stretched. 40 subjects were selected from Saveetha College of Physiotherapy by inclusion and exclusion criteria. All these subjects understood the purpose of the study and inform constant was obtained prior to participation. Initially these 40 subjects have been given self-assessment Bournemouth questionnaire to assess neck pain. Each subject has been taken Craniovertebral angle test by using goniometry. Followed by initial assessment subject with Upper Cross Syndrome have been given stretching and strengthening exercises for three weeks. Post-test was done after three weeks. STATISTICAL ANALYSIS: The collected data was tabulated and analyzed. To all parameters mean and standard deviation (SD) was used. Unpaired t-test was used to analyze significant changes between pre-test & post-test measurements. RESULT: The statistical analysis revealed statistically significant difference in pain and CV angle using stretching and strengthening exercise among subjects with Upper Cross Syndrome. The post- test values gradually decreases in BMQ test and increases in CV angle test. CONCLUSION: From the result, it has proven that effectiveness of stretching and strengthening exercises on Upper Cross Syndrome decreases the pain range and normalizes the CV angle.**

Keywords: **Craniovertebral angle, Upper cross syndrome, Shoulder girdle exercises, Bournemouth questionnaire average.**

I.INTRODUCTION

Upper cross syndrome is a muscular imbalance discovered by Vladimir Janda, a Czech physician and physiatrist. [1] it's also referred to as proximal or shoulder crossed syndrome, cervical crossed syndrome, slouched posture, and student syndrome. Upper-Cross Syndrome (UCS) is also referred to as proximal or shoulder girdle crossed syndrome.[2] In Upper Cross Syndrome there will be tightness of the upper trapezius and levator scapula on the dorsal side crosses with tightness of the pectoralis major and minor.[3]

According Vladimir Janda Upper Cross Syndrome is said to be over activity of the upper trapezius, levator scapulae, sternocleidomastoid and pectoralis muscles, with weakness of the deep cervical flexors, lower trapezius & serratus anterior. [4, 5] Over use and no use of these muscles gradually leads to dysfunction and injury later to disability. Often characterized by tightness and weakness of certain muscles over the neck and shoulder region.

It is one of the commonest postural disturbances which can cause neck pain; rounded shoulders, forward head posture and head ache may or may not be seen. In Upper Cross Syndrome there is increase in volume of neck and shoulder pain, tension headaches, and chest tightness. It is caused by chronic bad posture, and it is signified by rounded shoulders with an anteriorly tipped shoulder blade, forward poking chin and an apparent curve in the neck and upper back. As a result, tightness of the pectoral and neck muscles, arm flexors. Upper Cross Syndrome is seen in any individual with poor posture, it is very much prone to desk workers, swimmers or professional. Three synovial joints and two functional articulations make up the shoulder girdle complex.[6] In this study stretching and strengthening of the shoulder girdle muscles will be given to prevent shoulder pathologies.

There are less prevalence and intervention studies about upper crossed syndrome. [7, 8] Prevalence of Upper Cross Syndrome among the medical students of university of Lahore has been done on 2016. In this study relation between Upper Cross Syndrome and bad posture were seen and it was found that the individuals suffering with Upper Cross Syndrome were somehow related to bad posture or indulge in activities which make individual to adopt a posture go high physiologic cost there by leading to muscular imbalance that will yield Upper Cross Syndrome and prevalence of Upper Cross Syndrome among medical students of university of Lahore was found to be 37.1%. [9]

Posture can be analyzed by various methods like ordinal scales, goniometry, devices to measure distance between bony points, Bournemouth questionnaire and CV angle using, Bournemouth questionnaire quick and easy to complete and has showed to be reliable, valid and responsive to clinical significance changes among subjects with non-specific neck pain. [10, 11] CV angle has also proven to be effective to measure neck posture

Physiotherapy treatment may help to relieve the pain and correct the posture by strengthening the week and elongated muscles and stretching the tight muscles. If it is not corrected in earlier stages it can result in McKenzie's concept of de-arrangement and dysfunction syndrome, reduced lung volume capacity and breathing difficulties and it can be change the breathing pattern.

Since the prevalence rate is found to be higher it is important to correct the muscle imbalance to prevent it from further problems. So the aim of this study is to analyses the effect of shoulder girdle exercises among physiotherapy students.

II. NEED OF THE STUDY

To find out the influence of strengthening and stretching exercises on Upper Cross Syndrome among students

III. METHODOLOGY

Forty subjects were recruited from Saveetha Medical College and Hospital, Saveetha University, Thandalam, The subjects those who fulfill the inclusion and exclusion criteria were participated in the study. Such eligible subjects were selected in the study after obtaining informed consent.

2.1 Inclusion criteria with age group 18-25 years, Both male and female will be included, Subject who have posture with forward head and rounded shoulder, BMQ average about 15%, CV angle range below 48 degree
2.2 Exclusion criteria any fractures over the neck and upper back region, Inflammation/ Any joint effusion, Joint instability, Recent injury / significant pain, Diseases affecting the tissue being stretched.

2.3 Procedure:

There were 40 subjects selected from Saveetha College of Physiotherapy by inclusion and exclusion criteria. All these subjects were made to understood the purpose of the study and inform constant was obtained prior to participation. The subjects had mean age group of 20.82 ± 1.7. Of these 40 samples 52.5% were females (21) and 47.5% were males (19).

Initially these subjects were given self-assessment Bournemouth questionnaire to assess neck pain. The subjects took 5-7 minutes to complete the questionnaire. Following this Craniovertebral angle of each subject was tested by using goniometry, the axis of goniometry placed on the acromion process and the stable arm placed over the lateral spinous process of C7 horizontally and the movable arm placed over the tragus and the angle taken by moving the movable arm to the tragus.

Followed by initial assessment subject with Upper Cross Syndrome that is score of 30+ in BMQ and CV angle of less than 53, have been given stretching and strengthening exercises for three weeks. Post-test was done again using BMQ and CV angle after three weeks.

2.4 Treatment protocol:

1. Levator scapulae stretch: Rotate head to 45 degrees to the left. Place left hand behind the head and gently pull it at an angle toward the knee. Stretch the muscle in this manner for 5 to 10 seconds and repeat for 3 times

2. Upper trapezius stretch: Sit straight up in a chair with shoulders relaxed. Bring the head gently to the shoulder. Stabilize the head by the same side hand. Hold this position for 20 seconds. Rest 15 seconds and repeat again twice on other side.

3. Pectoralis door-way stretches: Placing one or both arms along the door way wall and slightly stepping forward will apply some pressure to the muscles. Be sure not to step too far forward and strain your low back by over extending it. Repeat it for 5 times.

4. Foam roller: Lay over a foam roller with the hands under the head. Bridge up off of the floor and roll back and forth over upper thoracic kyphosis. Repeat it for 1 minute.

5. Scapular retractions: Bring the shoulder blades (scapulae) down toward the ground and back. This activates the rhomboids and lengthens the pectoral muscles. [12] Repeat this for 5 times.

6. Chin-tucks: Sit up straight, now move head slightly straight backwards creating the "double chin" effect. This will help combat the forward head carriage that many people suffer from. Repeat it for 3 times.

7. Brugger posture: Stand up from the desk, open the hands up and rotate the thumbs backwards. This will relax the upper traps and allow the shoulder blades to slide down and back to the back pockets. Take a deep breath in through the nose and slowly let it out through the mouth. Hold this position for 10 seconds and repeat for 2 times.

8. Middle and lower trapezius strengthening: Keep the torso as straight as possible while creating a curvature on the lower back, or sticking your chest out. Exhale and pull self-up until your head is above the bar. Concentrate on using biceps repeat for 1 minute. [13]

9. Serrates anterior strengthening: Draw your right shoulder blade closure to your spine. Keep the right palm planted firmly and turn the body counterclockwise, toward the left, until your torso is facing forward and right arm is behind you. Hold the stretch for 20 seconds then repeat it opposite side. [14]

2.5 Outcome Measures: Pain will be assessed by the Bournemouth questionnaire which is asked to fill the students itself and the angle will be examined by using of goniometry.

IV. STATISTICAL ANALYSIS:

The collected data was tabulated and analyzed. To all parameters mean and standard deviation (SD) was used. Unpaired t-test was used to analyze significant changes between pre-test & post-test measurements

V. RESULTS: From the statistical analysis revealed statistically significant difference in pain and CV angle using stretching and strengthening exercise in patients with Upper Cross Syndrome. In this study females are more affected than females in Upper Cross Syndrome. The post-test mean 16.92 and SD 9.00 of BMQ and the post-test mean 50.80 and SD 2.55 of CV angle has shown improvement. These values suggest gradually decreases in BMQ test and increases in CV angle test. The un-paired t-test t value of BMQ 5.5312 and t-value of CV angle 4.4616 and the p-value is less than 0.0001 shows that study is significant.

Table-1

Pre-test and Post-test values of BMQ

TEST	MEAN ± SD	P-VALUES
PRE-TEST	48.00 ± 3.04	0.0001
POST TEST	50.80 ± 2.55	

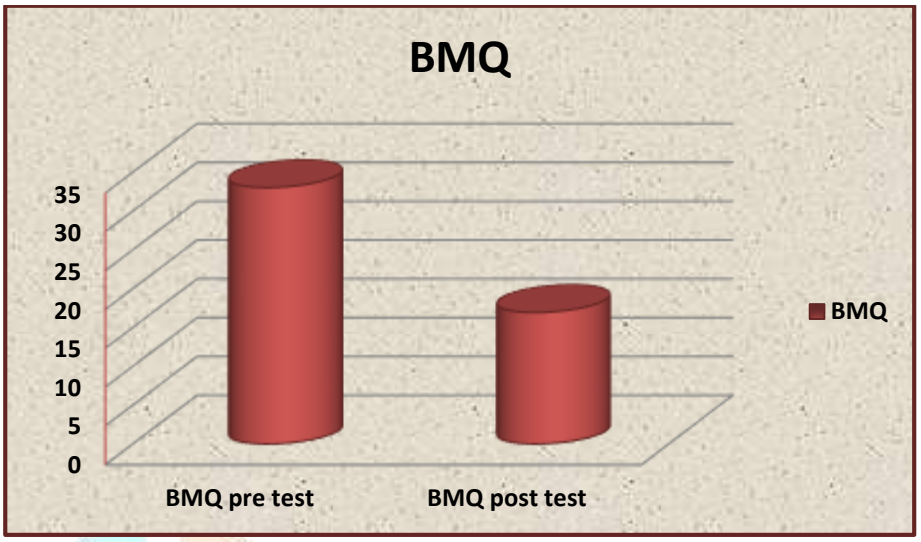
Table-2

Pre-test and Post-test values of CV Angle

TEST	MEAN ± SD	P-VALUES
PRE-TEST	33.01 ± 16.03	0.0001
POST TEST	16.92 ± 9.00	

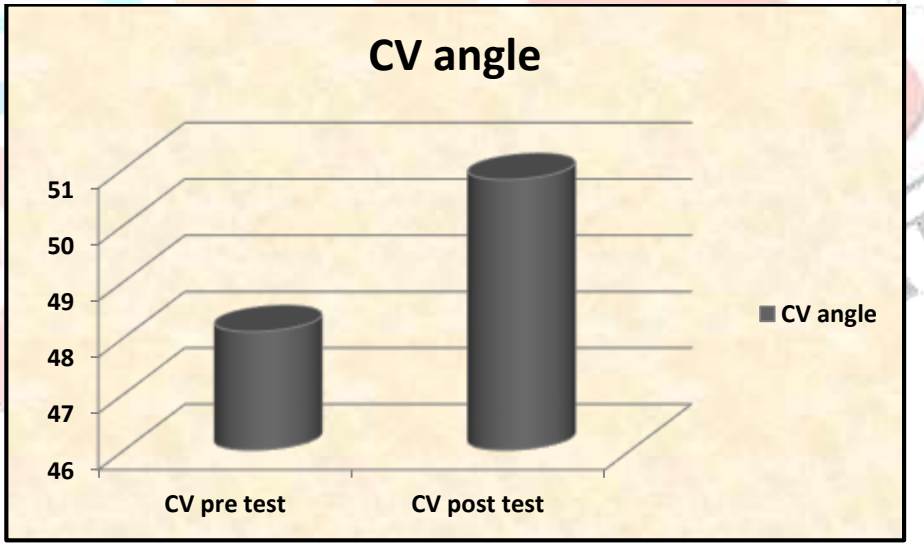
GRAPH: 1

Graph showing pre and post-test values of BMQ



GRAPH: 2

Graph showing pre and post-test values of CV angle



VI. DISCUSSION: In shoulder girdle imbalance there is without any constitutional disturbance pain starts suddenly across the top of the shoulder-blade and may radiate down the outer side of the upper arm or into the neck. Upper cross syndrome refers to a particular configuration of over lapping, over active and under active muscle group in neck chest and shoulder. According to Craig Lie Benson, upper crossed syndrome is due to muscular imbalances which cause postural overstress. [15]

In Upper Cross Syndrome shoulders are pulled forward by the arms. Insertion of the rhomboids muscle which is takes place in between the shoulder blades becomes progressively weak and sore because of overstretched .A misapprehension is tight muscles are the common cause for the pain. Meanwhile weak and overstretched muscles are being pulled, often cause pain and extreme soreness. This pattern of the balance of the muscle creates dysfunction of the joints; especially at the atlanto occipital joint, C4-C5 segment, cervicothoracic joint, glenohumeral joint, and T4-T5 segment. [16] Janda noted that these transitional zones are affected by the stress which is creates morphological changes in vertebrae. So then need to correct this postural problem is important. [17]

So the aim of the study to analyse the effectiveness of shoulder girdle exercises on upper cross syndrome among students. 40 subjects were selected and all these subjects understood the purpose of the study and inform constant was obtained prior to participation. Initially these subjects have been given self-assessment Bournemouth questionnaire to assess neck pain and each subject Craniovertebral angle is measured using goniometry. Followed by initial assessment subject with Upper Cross Syndrome have been given stretching and strengthening exercises for three weeks. Post-test was done after three weeks.

Using un-paired-t-test the post-test values were analysed the results showed gradually decreases of neck pin that was assessed using Bournemouth questionnaire and obtained normal postural alignment that was measured as increases in CV angle test.

Bournemouth neck pain self-assessment questionnaire has been found to be positive in most of subjects. Few components were rated higher. Complaints were on anxiety and depression (Q.No:4& 5).Although stretching and strengthening exercises has provided a significant benefit for shoulder girdle muscular imbalances. This in turn can suggest that neck pain can be more of psychological impairment rather that musculoskeletal problem. Following exercises and counselling participants has shown improvement.

The Craniovertebral angle test normal range is 53-55deree, while doing the test average, 44-48 angle were obtained. After post-test, the angle gradually increase up to 49-53, so that has been proved Stretching and strengthening exercises has provided a significant benefit for the Upper cross syndrome. Stretching and strengthening exercises has provided a significant benefit for the muscular imbalances which is associated with the major involvement of trapezius muscle found with UCS. Due to the complex nature of this disorder other components that must be identified or addressed for maximum improvement of the clinical findings. Lie Benson has stated that key elements to the treatment of UCS include restored joint mobility, normalization of muscle activity and endurance, and functional stabilization of cranio-cervical, scapula thoracic, and glenohumeral mechanics. [18]

VII. CONCLUSION: The study result showed that that effectiveness of stretching and strengthening exercises on Upper Cross Syndrome decreases the pain range and increases the CV angle among students.

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