Review Article

Upper crossed syndrome: trends and recent advances in physiotherapy

Abstract:

BACKGROUND: how does it affect the quality of life of the patient?

Upper Crossed Syndrome (UCS) is also discussed as proximal or shoulder crossed syndrome. According to Vladimir Janda, UCS is characterized by the tightness of the levator scapulae muscle, upper trapezius muscle, on dorsal sides crosses with tightness of pectoralis major muscle and minor muscle. Weakness of the deep cervical flexors ventrally crosses along with weakness of the middle and the lower trapezius. The weakness and tightness lead to postural imbalance. In addition to this, it creates postural patterning of rounded shoulder forward head posture, loss of cervical lordosis and increased kyphosis. These can lead to overall change in the pattern of upper quarter of the body.

What are the available treatments? Stretching, strengthening, myofascial release, postural relaxation exercise, electrical stimulations, and deep neck flexors activations are the most used techniques. Recent trends are also shown some benefits in terms of time efforts, and prognosis. Those are dry needling, corrective games, scapular stabilization exercise, physioball exercise, and PNF techniques.

MATERIALS AND METHODS: out of 17 articles screened 8 studies are included in this review according to the inclusion and exclusion criteria. The inclusion criteria are forward head posture, students, articles from the year 2011 to 2021, age of 20-50 years old, an article published in English languages, articles available in full text book and RCT'S. The exclusion criteria are Persons without forward head posture, articles before 2011, age less than 20 years and more than 50 years old, articles published other than English languages, and text not available in full relevant studies were retrieved through Cochrane, PubMed, google scholar and Embase databases from the year 2011 to 2021. The keywords used for the search were upper crossed syndrome, forward head posture, rehabilitation, postural disorders, and rounded shoulder. Total 8 randomized controlled trials were included in this study according to the inclusion criteria.

Result: a total of 17 articles were screened. 8 met the inclusion criteria.

CONCLUSION: all physiotherapy interventions like strengthening and stretching, resistance exercises, postural correction exercises, and ROM exercises have a possible effect on the prevention and treatment of upper crossed syndrome. Also, recent trends like dry needling, physioball exercises, yoga therapy, myofascial trigger release, eccentric muscle energy technique, Kinesio taping, and IFT and EMG activity has shown beneficial result in UCS.

Keywords: upper crossed syndrome, forward head posture, physiotherapy in upper crossed syndrome, postural disorders, and rounded shoulder.

1. INTRODUCTION:

UCS also known as 'cervical crossed syndrome' was coined by Vladimir Janda. There are two major categories of derangements, tightness and weakness. A tight muscle included of upper trapezius, pectoralis major & levator scapula, and a weakening group comprises of rhomboids, middle trapezius and lower trapezius, serratus anterior, and a deep neck flexor, frequently the scalene muscles [(1)]. The condition is defined as a postural disorder or postural imbalance with overactive upper trapezius and pectoralis musculature [(2)]. Also, there is inhibition of the middle and lower trapezius, which results in mainly winging of the scapula, elevated, protracted and abducted scapula [(3)].

There can be a muscular imbalance between tonic and phasic muscles. Among which tonic muscles go for tightness and phasic muscles go for weakness based on over facilitations and lower activation respectively [(4)].

UCS is a direct effect of flexor-dominated postures. People who present with upper crossed syndrome will have clinical features of forward head posture, slouching of the thoracic spine (rounded upper back), protracted and elevated shoulders, scapular winging, and decreased flexibility of the thoracic spine [(5)].

How this will affect the patient?

Patients frequently complain of neck pain, headache and interscapular pain. This form of imbalance creates cervical and thoracic joint dysfunction, predominantly at the atlantooccipital joint region, C4-C5 segment, cervicothoracic joint, T4-T5 segment and glenohumeral joint, strain, intersegmental joint dysfunction, discogenic pain, rotator cuff syndrome, degeneration, vertigo, costo-vertebral dysfunction, thoracic outlet syndrome, and TMD [(6)]. Not only can UCS prompt to postural changes in the upper back (it is also called as

hyperkyphosis of the thoracic spine region) which will also lead to asthma and respiratory problems [7]. Proprioceptive senses is having two significant roles in the neck region: they give information on cervical spine movement pattern or motion to the central nervous system, and posture and they attain stability by cervical reflexes and protect the cervical spine.

Biomechanical variations and posture imbalance will result in the early onset of osteoarthritis in the lower cervical spine and upper thoracic spine region. Another probable complication of UCS is it can lead to functional shoulder impingement [8].

Where does the examination starts from?

Assessment of UCS starts with observation [8]. The accurate standing posture, when viewed from the lateral side, in a plumb line normally passing through the ear, shoulder region, greater trochanter, and slightly anterior to the lateral malleoli. Postural evaluation of patients with UCS will express a forward head and neck posture with upper cervical lordosis, protracted and elevated shoulders, thoracic hyperkyphosis and scapular winging [9].

Hypertonicity may precipitate in upper trapezius, levator scapulae, pectoralis major, and Sternocleidomastoid [2]. On palpation UCS tenderness or trigger point activity will be present in the above-mentioned muscles as well as the simultaneously weak rhomboids, serratus anterior, middle trapezius & lower trapezius, deep neck flexors and scalenes. Four to six sessions of MFR therapy are frequently recommended before the stretching treatment starts. The treatment must involve all the muscles linked with UCS. Functional assessment of neck flexion is evaluated by "neck flexion test.

Patients with upper crossed syndrome will often demonstrate abnormal shoulder flexion and abduction. Arthokinetic reflex also should be analyzed at the time of testing [11]. The normal sequence for shoulder abduction is the progressive firing of the supraspinatus, deltoid, infraspinatus, middle and lower trapezius, and contralateral quadratus lumborum muscle. Patients with upper crossed syndrome commonly demonstrate early shoulder elevation. Also, patients have weak scapular stabilizers (serratus anterior) [6].

What are the conventional physiotherapy treatments?

Stretching will improve the capability to rotate a single joint or sequences of joints smoothly and effortlessly through an unrestricted, pain-free range of motion, joint integrity, muscle length, and periarticular soft tissue extensibility all interact to determine flexibility [10]. Strengthening the weak muscles will bring back into good posture and helps in attaining good

strength. Position maintenance, Bruegger's position, and postural realization exercise should be thought to the patient so that they can maintain the position by their own. A myofascial release is a manual therapy technique, involves the application of a low load, long-duration stretch to the myofascial complex involved in UCS, proposed to restore optimal length, decrease pain, and improve function. Helps in getting rid of the trigger points [(11)]. The proprioceptive neuromuscular facilitation technique's main goal of the treatment is neuromuscular re-education. Some of the PNF techniques used were contract-relax, hold relax, and rhythmic initiation. Recent literature says these treatments are beneficial. We aim to produce a quality review on upper crossed syndrome and the recent trends in physical therapy [(12)].

What are the recent trends?

According to recent reviews, Kinesio taping helps in improving the craniovertebral angle and forward shoulder angle. In a tonus-decreasing muscle application, the elastic stretch tape, kinesio taping exerts tension in the direction of insertion of the muscle to the fixed base and similarly displaces the skin in the same direction. This brings about support of muscle contraction. This causes a reduction in muscle contraction [(1)]. yoga therapy is also showing recent advances in correcting upper crossed syndrome. It affects the cervical, shoulder, and thoracic flexion angles in people with UCS. Generally, maintaining such activity and a healthy lifestyle through yoga exercise can be the main element in correcting the UCS [(13)]. Corrective exercises program on EMG activity of scapular muscles and neck muscles decreases the activity of SCM and upper trapezius muscles, serratus anterior and lower trapezius ratio, increasing activity of serratus anterior and lower trapezius. it can be stated corrective exercise (stretching, strengthening, and stabilization exercises) is safe to improve the muscles of the upper quadrant [(14)]. Physioball exercise shows significant improvement in upper crossed syndrome and decreases the kyphotic posture too [(15).]

Study selection and data extractions:

Inclusion criteria: randomized controlled trials, articles published in English language, population age ranges between the age group 20-50 years old, patients with forward head posture, data collected in between the years 2011-2021, RCT'S and most of the studies done in students.

Exclusion criteria: studies not related to upper crossed syndrome were excluded, persons without forward head posture, articles before 2011, age less than 20 years and more than 50 years old, articles published other than English languages, and text not available in full

DISCUSSION:

upper crossed syndrome is one of the most frequent conditions occurring among young adults and persons who work in a postural imbalance pattern for a longer time. according to Global Burden Of Disease (GBD) 2010, neck pain is 21st amongst of overall burden of disease. over usage of myofascial or stressed myofascial where it develops adhesion and becomes trigger points [(2)]. muscle imbalance can directly affect the body's normal alignment and causes postural abnormalities. commonly seen in people who sit for extended period of time or in people who apply recurrent overload patterns to the upper girdles. Research has shown that strengthening, stretching, MFR, taping, IFT, dry needling, Bruegger's position maintenance can improve the entire posture and bring back the imbalanced posture into normal alignment [(16)]. Among all the articles selected these few shows recent advances and trends those are, Shakeel Ahmed et. Al (2019) has conducted an RCT in which the experimental group received myofascial trigger point release technique for 1 session per week and continued for 6 weeks and the control group received self-stretching technique of upper trapezius muscles, pectoralis muscle and levator scapula muscle, hold for 10 - 15 seconds of 10 repetitions in each session along with the experimental group exercise. That patients in the control group improved pain and disability more than group a with pain and disability and myofascial trigger point release along with self-stretching is an effective method compared to myofascial trigger point manual release alone in UCS and it is shown to be beneficial. Amrutkwar rayjade et.al (2020) randomized into two groups a received pectoralis major inhibitory technique, middle and lower trapezius facilitation. Serratus anterior and Deep neck flexors strengthening, along with a hot pack for 15 minutes can also be given. Group b was given a hot pack for 15 minutes, IFT for 20 minutes for upper back and deep neck flexors, serratus anterior strengthening, and stretching exercise. The outcome measures used are visual analog scale, craniovertebral angle & forward shoulder angle measurements. The study showed that there was a significant improvement in craniovertebral angle and forward shoulder angle within the pre and post-group interventions and the experimental study [(1)]. Syeda nida gillani et.al (2020) conducted a study. The experimental group received conventional TENS was

applied for up to 10-20 minutes. Soft tissue tension and pain were treated using either TENS or hydrocollatoral pack & infrared (IR) light for 10 minutes. The control group received similar as the experimental group A treatment was given along with TENS, IRR & cervical segmental mobilization. Both the technique used was found to be equally effective in improving cervical range of motion, decreasing pain, and dropping neck disability [(15)]. Arif Ali Rana (2020) done a study where experimental group received conventional physiotherapy along with strengthening exercise for deep neck flexors, serratus anterior, lower trapezius and rhomboids, 2 sets of 10 reps per day and stretching exercise for tightened muscles,20 sec hold for 5 reps. Also, hot pack for 20 minutes in the painful areas, the control group received conventional physiotherapy with MET on upper trapezius & levator scapulae muscles for 5 reps using at most isometrics' contractions. Vas and neck disability index were used as outcome measures. The result of the study showed decreasing in pain along with MET was effective in decreasing pain during 1st half of the treatment in comparison with the 2nd half [(16)]. Rasoul arshadi et.al (2019) conducted a study on patients whose craniocervical angle and forward shoulder angle more than 46 degrees and 52 degrees. the experimental group received stretching, strengthening and stabilization exercise and control group received routine physiotherapy care. The outcome used was EMG for upper and lower trapezius, serratus anterior and sternocleidomastoid. results found that eight-week corrective exercise succeeded in decreasing activity of SCM and upper trapezius muscles, upper trapezius/serratus anterior and upper trapezius/lower trapezius ratio, increasing activity of serratus anterior and lower trapezius [(17)].

Conclusion: the quality of the article is determined based on the criteria that; the article requires minimum score 5 out off 11. Among all the review articles 8 studies are quality researches with level 2 evidence and systematic review in this field is warranted. the remaining areas require high quality articles to determine the effect of treatment program.

Limitations: although, this review included only the RCTs. Another limitation is that the reviews have not focused on the prevalence of UCS among students and desktop workers as the condition is mostly seen in these populations.

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