

The Efficacy of Treatment for Upper Crossed Syndrome and the Involvement of Chiropractic:

By Kyle Tiefel

Advisor: Jay Elliott, M.Ed., DC

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Abstract

Introduction: The purpose of this paper is to review the literature obtained through research on the condition of Upper Crossed Syndrome and the conservative treatments for this condition including chiropractic treatments, and come up with a conclusion on what treatments are more effective.

Methods: PubMed, CINAHL, and the Index to Chiropractic Literature were searched from 2000 through 2011 using the following search terms: Upper Cross Syndrome, conservative treatments for Upper Crossed Syndrome, and chiropractic and Upper Crossed Syndrome.

Discussion: Many conservative treatments can be effective in treating patients with Upper Crossed Syndrome. Chiropractors and physical therapist have similar views on how to properly treat patients with UCS. They differ, however, in that chiropractors use of manual therapy adjustments.

Conclusion: A combination of muscular reeducation and manual therapy to the spine is more effective in treating patients with UCS than only using manual therapy by itself or muscular reeducation by itself.

Keywords: (1) *Upper Crossed Syndrome*, (2) *manipulative therapy*, (3) *muscular imbalance*, (4) *poor posture*, (5) *postural changes*, (6) *fatigued muscles*, (7) *osteoarthritis*, (8) *inflammatory chemicals*, (9) *subacromial impingement*, (10) *biomechanics*, (11) *instability*, (12) *tendonitis*, (13) *rehabilitative exercises*, (14) *neck and shoulder disability index scores*.

Introduction

The purpose of this paper is to review the literature obtained through research on the condition of Upper Crossed Syndrome and the conservative treatments for this condition. The paper will also review information on the treatments by chiropractors for Upper Crossed Syndrome. To get a better understanding of the paper it is important to know information about UCS.

UCS is a condition that affects the musculature in a person's upper back and neck. Certain muscles in a person's body become stronger while others become weaker. The muscles that normally become stronger are the upper trapezium, levator scapulae, SCM and pectoralis major muscles, and the muscles that become weaker are the lower trapezium, serratus anterior, and deep neck flexors. The imbalance in a person's musculature is usually a result of prolonged slumped posture and decreased physical activity. It is for this reason that a high percentage of students have and are diagnosed with UCS. Individuals who work at a desk and computer most of the day are more likely to have this condition as well.

Over time UCS can lead to complications in a person's physical health and well being. Not only can UCS lead to postural changes in the upper back over time, known as hyperkyphosis of the thoracic spine, it can also lead to respiratory problems and asthma. Other complications include neck, back, and chest wall pain. This pain can result from movement dysfunction of the back and neck from muscle imbalances which lead to fatigued and overused muscles. As the muscles get fatigued they release more inflammatory chemicals and become sore and spastic. Over time this change in biomechanics and posture will result in early onset of osteoarthritis in the upper thoracic and lower cervical spine. Another possible complication to upper cross syndrome is functional shoulder impingement. It is therefore important to properly diagnosis and treat this condition before these complications occur.

This condition is of great concern to athletes who perform overhead motions such as swimmers or pitchers. One of the main conditions seen in athletes who perform overhead motions is subacromial impingement. Subacromial impingement occurs when the structures in the SAS (rotator cuff, biceps tendon long head, and subacromial bursa) become compressed and inflamed under the coracoacromial ligament². There are two causes of subacromial impingement, structural and functional. Structural impingement is caused by a decreased subacromial space

from structural anomaly, inflammation, or bony growth. Functional impingement is from muscular imbalance mainly caused by instability of the glenohumeral head. The act of throwing can cause excessive microtrauma in the tissues below the coracoacromial arch which causes inflammation and tendonitis in that area as well. Excessive tightness of the upper trapezius, pectorals and levator scapula, and weakness on the agonist muscles of the shoulder. This leads to a decrease in deceleration of the shoulder during explosive activities. This leads to an overall decrease in shoulder stability and increase chance of impingement.

Treatment for UCS can vary depending on the severity of the condition. Treatments usually involve some muscular reeducation through stretches and exercises designed to relax hypertonic muscles and strengthen weak hypotonic muscles. Modalities can also be used such as electrical stimulation to weaken or strengthen certain muscles. Chiropractors use manual adjustments to the fixated segments along with stretching and exercise to treat UCS patient

Data

According to a research article by Phil Page in the International Journal of Sports and Physical Therapy, there have been several studies of athletes with shoulder pain that have described altered EMG patterns and patterns of muscle imbalance. Overhead athletes with shoulder dysfunction typically have increased upper trapezius activation,³ as well as decreased activation levels of the serratus anterior, and lower trapezius,⁴ supporting Janda's belief that the lower trapezius and serratus are most prone to weakness.⁵ Researchers have compared the EMG activity of the trapezius in normal individuals, overhead athletes, and those with impingement.⁶⁻⁸ Cools reported that athletes with impingement have a significantly higher upper trapezius activation compared to normal subjects, a significant decrease in lower and middle trapezius activation, and altered trapezius muscle balance.³

Table 1.

EMG activation of subjects with and without impingement during isokinetic abduction at 120°/s reproduced from cools et al, 2007.

Patient Group	Upper Trap Activation	Lower Trap Activation	UT:LT ratio
Involved side (impingement)	95% MVIC	48% MVIC	2.19
Involved side (Control)	73% MVIC	62% MVIC	1.23
Uninvolved side (impingement)	74% MVIC	56% MVIC	1.56
Involved side (control)	74% MVIC	62% MVIC	1.36

A case report article from Valli Chiropractic states that a patient was treated for conditions of upper crossed syndrome. The case involves a 46 year old female who is a type 1 diabetic and has adhesive capsulitis along with upper crossed syndrome. The treatment consisted of spinal manipulation, ultrasound, and at home and in-office low tech rehabilitative exercises. After 3 weeks of treatment the patient had a 30% decrease in perceived pain of the neck and shoulder. The patient also had increased muscle function in deep neck flexors, and improved function of cervical extension and shoulder abduction¹. Neck and shoulder disability index scores also improved significantly. The following tables show the timeline of the progression of the patient.

Right Shoulder Range of Motion (degrees)

Date:	8/13/03	9/5/03	10/20/03	1/5/04*	2/25/04	4/28/04
Abduction	90	130	147	143	150	152
Adduction	30	35	32	35	35	44
Flexion	90	132	136	130	143	155
Extension	40	34	34	32	42	45
Int. Rot.	30	35	35	32	35	54
Ext. Rot.	70	56	52	70	72	78

Left Shoulder Range of Motion (degrees)

Date:	8/13/03	9/5/03	10/20/03	1/5/04*	2/25/04	4/28/04
Abduction	90	140	179	139	143	156
Adduction	50	41	42	38	43	56
Flexion	140	136	147	128	161	156
Extension	45	46	51	48	61	61
Int. Rot.	25	37	38	29	38	51
Ext. Rot.	55	68	68	75	77	72

Cervical Ranges of Motion (degrees)

Date:	8/13/03	9/5/03	10/20/03	1/5/04*	2/25/04	4/28/04
Flexion	50	49	59	60	60	60
Extension	35	44	50	29	47	55
R Lat. Flex.	20	24	30	31	29	32
L Lat. Flex.	20	30	29	31	34	38
R Rotation	60	70	68	68	74	73
L Rotation	75	76	73	62	78	80

Shoulder Injury Self Assessment Scores

Date:	Score
8/14/03	40.0%
9/5/03	28.3%
10/17/03	28.3%
1/7/04*	41.7%
2/25/04	23.3%
4/28/04	16.6%

Neck Disability Index Score

Date:	Score
8/14/03	42.0%
9/5/03	42.0%
10/17/03	33.3%
1/7/04*	54.0%
2/25/04	36.0%
4/28/04	10.0

In another case report article by HM Lee, stretching and exercises by a chiropractic doctor after adjustments were used to treat a patient with cervical and thoracic muscular imbalance congruent to upper crossed syndrome. The treatment was presented as follows:¹²

Postural correction was achieved through in-office repetitive repositioning of the patient and prescribed home exercises. Specific postural exercises included:

- Bruegger's Position of external arm rotation, shoulder abduction and retraction of the scapulae (see figure 4).

This position with simultaneous head and neck retraction is a strengthening exercise for deep neck flexors and lower scapular stabilizers.

- Postural Realization Exercise.

The patient is positioned with their back against a wall. Their shoulder blades and buttocks should be in contact with the wall. They are then instructed to retract their head and neck until the posterior occiput contacts the wall. They are to hold for 10 seconds.

Hourly repetition of these exercises is recommended.



Figure 4

Discussion

The research suggests that upper cross syndrome leads to conditions such as shoulder instability and spinal degeneration. This shoulder instability leads to impingement of the rotator cuff muscles and inflammation of the tendons surrounding the shoulder joint. The impact of the muscular imbalance of patients with upper crossed syndrome can be observed from table 1 in the data section. This data shows that of athletes who have shoulder impingement there is a significant increase in the neurological activation of the upper trapezius muscles and a decrease in the neurological activation of the lower trapezius and serratus anterior muscles. The dysfunction of the lower stabilizing agonist muscles of the shoulder lead to an over compensation of the upper muscles and antagonist muscles which increase the chance of postural dysfunction and the load of the shoulder joint. This increases the tissue inflammation of the muscles from over activation and tightness.

An article by Janda examines the treatment of muscular imbalance from upper crossed syndrome, and states that when treating patients with UCS the shortened muscles must be restored before embarking on training of the weakened muscles. This is based on Sherrington's Law of reciprocal inhibition which states that when one muscle is shortened or tightened its opposite muscle relaxes.^{10,11}

The way that Sherrington's Law works is that when one set of muscles are activated the opposing muscle group to the activated muscles will be inhibited.¹³ Treatments using this law can be effective in shorting the anterior compartment muscles of the torso and allowing for greater activation of the posterior compartment muscles of the torso.^{14,15}

Muscular reeducation therapies provided significant relief to patients with UCS. The research shows a decrease in pain symptoms and improved muscular balance with exercise and stretching and the use of electrical stimulation. This is the standard protocol with most health professions dealing with upper crossed syndrome. The main focus is on muscular reeducation to improve imbalances.

Chiropractic is unique in that it focuses not only on the muscular imbalances but on the function of the segments of the spinal cord that innervate the area of muscle imbalance. This allows for

proper function both mechanically and neurologically of the muscles of the thoracic and cervical spine that cause upper crossed syndrome.

Conclusion

Millions of people currently have conditions and/or complications related to upper crossed syndrome. The number continues to grow as more people are sitting at computers and desks and becoming less physically active. Upper crossed syndrome will continue to be a problem in the future and a good treatment protocol will be needed to effectively treat these patients.

There has been some research to suggest that muscular reeducation, through a modified workout program or electrical stimulation, is very effective in treating patients with upper crossed syndrome. There is also research to suggest that chiropractic manipulation along with muscular reeducation can be more effective in treating patients with upper crossed syndrome.⁹ However, there is little research so far on the subject and more will be needed to confirm one way or another whether chiropractic manipulation with muscular reeducation is more effective than muscular reeducation by itself.

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