

Short communication

A study to analyse the effect of McKenzie's method of exercise to treat upper cross syndrome associated with cervicogenic headache

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ABSTRACT

Introduction and Aim: Upper cross syndrome (UCS) occurs when the muscle in the neck, shoulders, and the chest become deformed usually as a result of poor posture. The aim of the study is to analyse the effect of McKenzie's method of exercise to treat upper cross syndrome associated with cervicogenic headache.

Materials and Methods: This experimental study was conducted in outpatient department physiotherapy A.C.S. Medical College and Hospital. Fifty subjects were selected for the study of the age group between 20 to 50 years of both male and female sex. Duration of this study was about 3 months. Each patient was trained about three session per week, 30 minutes per session. The session included McKenzie's method of exercise to improve the shoulder and neck movements and postural corrections of the subjects. The outcome measure done using visual analogue scale (VAS) for cervicogenic headache and upper cross syndrome questionnaire (UCS).

Results: The results on comparing upper cross syndrome questionnaire score and Visual Analog Scale score showed that between the pre-test (4.93) and post-test (3.43) mean values with group McKenzie's exercise showed highly significant difference. Thus, it is appropriate that McKenzie's method of exercise to treat upper cross syndrome associated with cervicogenic headache is effective.

Keywords: McKenzie's exercise; upper cross syndrome; cervicogenic head ache.

INTRODUCTION

The higher cross syndrome is referred to as the proximal or the arch crossed syndrome (1). In higher cross syndrome the tightness of the higher cowl muscle and also the levator scapulae on the dorsal aspect crosses with the tightness of the pectoralis and minor takes place (2). The weakness of the deep cervical flexors ventrally crosses with the centre and lower cowl muscle this pattern of imbalance creates joint phases C4 and C5 segment of cervical body part joint, glenohumeral joint and T4 and T5 segments (3). The syndrome arises due to muscular imbalance that from time to time develops between tonic and phasic muscle mass, tonic muscle group measure the muscle so that majority of time the muscle remains tight, over expedited whereas phasic muscles square measure the muscles of lower activation which are additional towards developing inhibition (4).

Poor posture cause stress on cervico- os and cervico-body part junction. Stability of scapulae is reduced thanks to the altered angle of glenoid fossa and as a result all the movement patterns of higher limb square measure changed (5). These focal square measure as of stress within the spine correspond to the transformation zone within which neighbouring bone amendment within the morphology of the precise bodily property changes are seen within the higher cross syndrome (6). Forward head posture can

end up an increase in cervical hollow-back and body part spinal curvature. This changes step by step increase muscular tension, impart stress on neck and shoulders which leads to pain, loss of independent function symptom and totally different fasciculus symptoms within the higher body which for certain people ends up in the elevation of prolonged shoulder and rotation or abduction and also the wringing of scapula (7).

These bodily property changes attenuated the glenohumeral stability because the glenoid fossa ends up in additional abduction. This needs the levator scapulae and also the higher cowl muscle inflated within the activation to take care of glenohumeral centration (8). The characteristics and also the symptoms of the higher cross syndrome condition typically lead to the weakness, numbness, swelling, restricted movements and mainly the weakness in and around the muscles and also the sinew of the rear, neck, shoulders, elbows, carpus and hands or the fingers. It would undoubtedly become terribly troublesome to carry the article or tools in their hands. This can additionally for sure, affects the standard of lifetime to associate in nursing individual (9).

The higher cross syndrome occurs thanks to maintaining of constricted postures for prolonged time. It will additionally end up in the restricted blood flow to the muscles (10). While sitting,

forward head position includes flexion of lower cervical region, extension of higher cervical region, and rounded shoulders, that in average reduces the length of muscle fibres, leading to extensor muscle torsion round the joints of higher cervical region(11). This abnormal state leads to contractile organ abnormalities which has de-wrinkled scapular upward rotation, larger internal rotation and anterior tilt, leading to issue to take care of upright sitting posture (12).

The computer users adopt a wrong posture of the neck, shoulders and also the higher limbs which remain in static position extending for prolonged duration. The longer that we tend to maintain such posture perpetually has the upper risk of developing such injuries. The fastened position additionally ends up in the rear injuries and causes the rear pain (13).

The higher cross syndrome in several age of both male, female as equal possibility of exposure (14). The international headache society revealed their international classification of headache disorders has revealed two basic classes of headaches, primary and secondary. Primary headache includes those of vascular origin (cluster and cephalalgia headaches) in addition as those of muscular origin (tension-type headaches). Secondary complication headache result from some other supply as well as inflammation or injuries of head and neck. Norwegian Dr. Ottarsjaasted coined the term “cervicogenic headache” in 1983 via way of means of spotting a sub cluster of headache sufferers with concomitant head and neck pain. The pathophysiology of cervicogenic headache consequences from a convergence of sensory information from cervical into the trigeminal nerve spinal as well as from higher cervical muscles, C2-3-disc, bone and internal arterial blood vessel arteries, meninges of the higher neural structure, posterior fossa (15).

The McKenzie exercise encourages self-care treatment through perennial exercises and focuses on extension, as well as vary of motion exercise, manipulation, and patient education (16). Spinal manipulation and mobilization are shown to be viable and safe choices within the short-run treatment of neck pain. Spinal artful care was declined by the patient that necessitated the requirement to use different treatment ways.

The McKenzie protocol, that has been unremarkably used for low back conditions may additionally be used within the treatment of mechanical neck pain. It makes use of comparable displays in pain response to spinal loading in neck movements and postures (17). It is used to measure the bodily property, dysfunction and derangement syndromes. The McKenzie methodology utilizes a loading strategy that comes with the centripetal phenomenon; this can be outlined as a fast amendment within the location of pain from

a distal or peripheral location to an additional proximal or central position of the spine (18).

MATERIALS AND METHODS

This study is an experimental study of comparative pre and post type. Sample of the study includes 50 subjects with upper cross syndrome associated with cervicogenic headache who were randomly selected and study conducted at ACS medical college and hospital. The study includes the software workers, cervical spondylosis, spondilitis, trapezitis. Patients selected based on the inclusion criteria was trained for 30 minutes per session. Three session per week for about 3 months. Intervention included McKenzie’s method of exercise to improve the shoulder and neck movements and postural corrections of the patients.

Cervical protrusion and cervical retraction

Movements were performed on a repeated basis. Repeated check motion demonstrates centralization of signs and symptoms with repeated retraction and extension at end range. These 15 degrees of increase in extension, the affected person being capable of retracting his neck.

Prone scapular stabilization

Referred to as shoulder blade squeezes, it is an isometric exercise responsible for resetting the shoulder blades. Lying face down with chin tucked, simply roll the shoulders back squeezing shoulder blades and hold for 15 to 30 seconds, 8 to 15 repetitions is advised to do.

Deep neck flexor (chin tucks)

Cervical spine exercise counteracts forward head position. Stand upright with back to wall. The muscles in the front of the neck should be active while holding this position for 5 seconds and repeat it 10 times.

Shoulders shrug McKenzie exercise for neck

For this McKenzie exercise, start from the chin tuck position and then elevate the shoulder and hold the position for set duration and return the normal position and repeat 10 times for 3 times a day.

Repeated shoulder horizontal adduction

The patient was instructed to perform passive shoulder horizontal adduction at 90° of shoulder flexion. The patient has to hold this position for about 15 to 30 seconds and this exercise to be repeated 2 to 4 times a day.

Repeated shoulder flexion

It became determined to discover repeated flexion first, as this became maximum confined and painful movement. Performing this passively with help from a doorway became demonstrated. The patient has to hold this position for about 15 to 30 seconds and this

exercise to be repeated 2 to 4 times a day.

Repeated shoulder extension

The patient was instructed on how to perform passive shoulder extension with overpressure. This movement produced no appreciable change in his symptomatic or mechanical baselines. Hold this position for 15 to 30 seconds and repeat 2 to 4 times a day.

Neck flexion McKenzie exercises

Drop your head towards your chest. Raise your hands and interlock your finger behind your head in any such manner that elbows points downwards. The weight of the hands will place stress on the head and assist you experience the stretch behind your neck.

The farther push your head closer to the chin, the extra stretch may be felt. This must be repeated for 10 times three times a day.

Outcome measures

Visual analogue scale (VAS)

A visual analogue pain scale is a pain assessment tool that has been used in numerous trials to assess many different types of pain. A VAS typically consists of 10cm line. The extreme left side of the line equals no pain, the extreme right side equals the worst pain. Patient places a vertical mark on the line indicating the severity of pain that the feel. Score equal to 4 or more is considered as moderate pain, a score of 7 or more is considered to be a severe pain.

Table 1: Comparison of upper cross syndrome questionnaire score (UCS) and visual analogue scale (VAS) score between pre and post-test within subjects

	Pre -Test Value of Upper Cross Syndrome Questionnaire Score (UCS) and Visual Analogue Scale (VAS) Score		Post - Test of Upper Cross Syndrome Questionnaire Score (UCS) and Visual Analogue Scale (VAS) Score		df	't' Test	significance
	Mean	SD	Mean	SD			
UCS	21.31	2.13	19.4	2.29	29	5.96	.000***
VAS	4.93	0.86	3.43	0.77	29	1.05	.000***

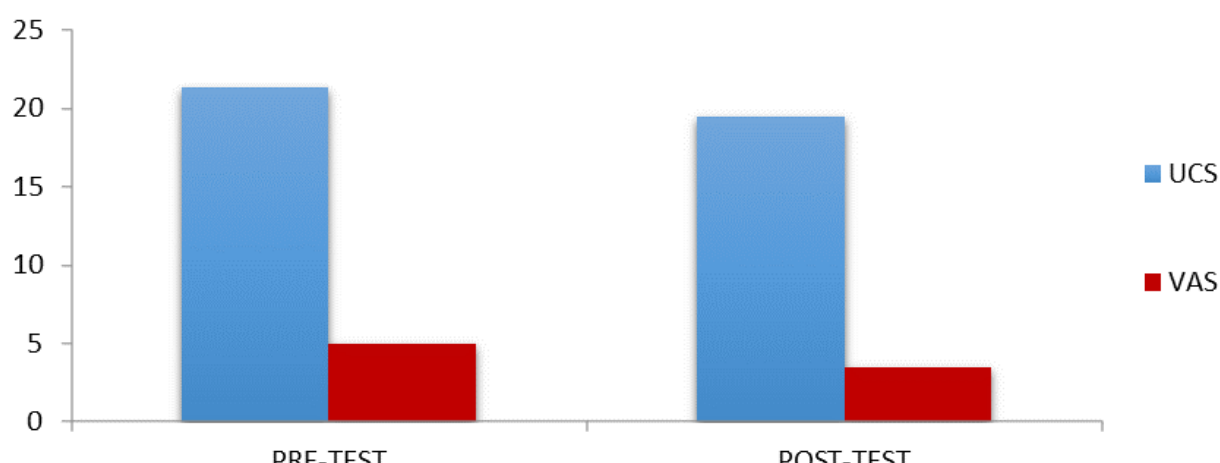


Fig. 1: Comparison of upper cross syndrome questionnaire (UCS) and Visual Analogue Scale (VAS) Score between pre and post-test

RESULTS

Table 1 shows that on comparing upper cross syndrome questionnaire score between the pre-test (21.31) and post-test (19.4) mean values within group treated with McKenzie's exercise shows highly significant difference between pre- test and post- test mean value at $P \leq 0.001$. On comparing visual analogue scale score between the pre-test (4.93) and post-test (3.43) mean values within group treated with McKenzie's exercise shows highly significant difference between pre- test and post- test mean value being at $P \leq 0.001$. Fig 1 shows that on comparing the upper cross syndrome questionnaire and visual analogue scale pre- test and post- test, the post- test values show highly significant. Hence null hypothesis is rejected.

DISCUSSION

Upper crossed syndrome was originated by Vladimir Janda. Dr Janda was known as the "Father of Czech Rehabilitation" graduated from Charles University in Prague in 1952, specializing in neurology and later in rehabilitation medicine. Janda was very interested in the functional role of muscles, and this led to testing his patients with surface electromyography. Chronic neck pain is a frequent symptom in the general population, particularly in women(18). From a cost-effective factor of view, it appears to be important to prevent sufferers from having incapacity. One manner in attaining this intention is to expand and check out more powerful remedies for acute neck ache, with the intention to prevent sufferers developing persistent ache and incapacity. Another

alternative is to protect chronic sufferers from incapacity via way of means of cautious management (19). Chronic neck ache is incredibly prevalent and a common source of incapacity in the working-age population (20).

The best status role regarded from the aspect is a plumb line passing via the earlobe, midway through the shoulder joint, midway via the trunk, through the greater trochanter, slightly anterior to the midpoint of the knee, and barely anterior to the lateral malleoli. From the back, the plumb line have to dissect the body via the midline with the alignment of symmetrical body components on every side (21).

Lewit delineates that the outside auditory meatus is aligned vertically over the clavicle and slightly anterior to the lateral malleoli. The sternocleidomastoid forms an angle of 45° to 50°. This affected person had altered posture, which can be a main contributor to his cervicogenic headache. The pathophysiology of the cervicogenic headache has additionally been related to degenerative adjustments in the higher cervical spine. Degenerative methods purpose loss of motion and dysfunction, which cause inflammation to the pain-sensitive structures.

The McKenzie method of care has been successful in the treatment of neck pain in the short term. The McKenzie system of diagnosis and treatment promotes a more active patient-directed approach. However, the methodology tends to be overly simplistic. The pre and post-test values on comparing upper cross syndrome questionnaire the post-test mean values are highly significant within the mean difference value at $P \leq 0.001$. The pre and post-test values on comparing visual analogue scale score the post-test mean values are highly significant within the mean difference value at $P \leq 0.001$. On comparing the upper cross syndrome questionnaire and visual analogue scale shows that McKenzie's method of exercise to treat upper cross syndrome associated with cervicogenic headache is highly significant.

CONCLUSION

This study reveals that there is a significant difference in subjects with upper cross syndrome associated with cervicogenic headache. On comparing the pre-test and post-test there is significant difference in movement and also reduction in pain and muscle weakness, which shows increase in range of motion of the patient.

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CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

REFERENCES

1. Muscolino, J. Upper cross syndrome Journal of the Australian traditional Medicine Society 2015; 21(2): 82-85.
2. Page, P., Frank, C., Lardner, R. assessment and treatment of muscle imbalance ebook 2010.
3. Page, P. Shoulder muscle imbalance and subacromial impingement syndrome in overhead athletes. Int and sports phusther. 2011 Mar; 6(1): 51-58.
4. Christenson, K. Manual muscle testing and postural imbalance. Dynamic Chiropractice 2000.November 15, 2000; 18 (24):
5. Moore, M. K. Upper cross syndrome, and its relationship to cervicogenic headache. J manipulative Physiol Ther. 2004; 27(6): 414-420.
6. Steinmetz, A., Seidal, W., Mucbe, B. impairment of postural stabilization system in musicians with playing related musculoskeletal disorders J Manipulative Physiol Ther. 2010 Oct; 33(8): 603-611.
7. Mckenzie. Treat your own neck. Lower hutt. spinal publication. 1983: 80.
8. Kim, S. V. The effect of Mckenzie exercise on forward head posture and respiratory function. Department of physical therapy. Graduate School, Catholic University of Pussam. 2014; 31(6): 351-357.
9. Jang, J. W. The effects of sling exercise and Mckenzie on forward head posture. Graduate school, Sahmyook University. 2017; 30(8): 1103-1107.
10. Jeong, Y. W. effects of Mckenzie exercise on the functional recovery and forward head posture of chronic neck pain patients. J Korean Soc Phys Med, 2006; 1(1): 93-108.
11. Janda, V. Muscles and cervicogenic pain syndromes in grant R.ed physical therapy of the cervical and thoracic spine. New York NY Churchill livingstone. 1988; 153-166.
12. Roth, J. K., Roth, R. S., Weinraub, J. R., Simkons, D. G. Cervicogenic headache caused by myofacial trigger points in the sternocleidomastoid: A case report. Cephalagia. 2007 Apr; 27(4): 375-380.
13. International Headache Society. The international classification of headachedisorders. 2nded. Cephalagia, 2004; 24 Suppl 1: 9-160.
14. Yoo, W. G. Effect of the neck retraction taping (NRT) on forward head posture and the upper trapezius muscle during computer work. J PhysiotherSci. 2013; 25: 581-582.
15. Evjenth, O., Hemberg, J. Muscle stretching in manual therapy: a clinical manual Sweden, AlftaRehabForiag, 1994.
16. Kim, D. J., Cho, M. L., Park, Y. H., Yang, Y. A. Effects of an exercise program for posture correction on musculoskeletal pain. J PhysiotherSci, 2015; 27: 1791-1794.
17. Oh, S. H., Yoo, K. T. The effects of stabilization exercises using a sling and stretching on the range of motion and cervical alignment of straight neck patients. J Korean Joc. Sports Phys Ther., 2016 Feb; 28(2): 372-377.
18. Bovim, G., Schrader, H., Sand, T. Neck pain in the general population. Spine. 1994; 19(12): 1307-1309.
19. Borghouts, J. A., Koes, B. W., Vondeling, H., Bouter, L. M. Cost of illness of neck pain in the Netherlands in 1996. Pain 1999; 80(3): 629-636.
20. Cote, P., Cassidy, J. D., Carroll, L. The Saskatchewan Health and Back Pain Survey. The prevalence of neck pain and related disability in Saskatchewan adults. Spine. 1998; 23(15): 1689-1698.
21. Gross, A. R., Kay, T., Hoadras, M., Goldsmith, C., Haines, T., Peloso, P., *et al.*, Manual therapy for mechanical neck disorders: a systematic review. Manual Therapy. 2002; 7(3): 131-149.