(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 7, Issue 3 , Page No: 593-598
May-June 2024

IJMSCR

The Efficacy Of Various Stretching And Strengthening Techniques For Upper Cross Syndrome : A Literature Review

[1]P. Muthukrishnan ., [2]Dr. S. Rajadurai
[1]PhD Research Scholar., [2]Associate Professor
[1]Faculty Of Physiotherapy., [2]Meenakshi Medical College Hospital And Research Institute
[1,2]Deemed To Be University Meenakshi Academy Of Higher Education And Research.,Chennai.,Tamilnadu.,India

***Corresponding Author:**
P. Muthukrishnan
PhD Research Scholar, Faculty Of Physiotherapy
Deemed To Be University Meenakshi Academy Of Higher Education And Research.,
Chennai.,Tamilnadu.,India

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Introduction: Postural disorders and spinal deformities can be congenital or acquired. Acquired postural disorders can be a consequence, to a large extent, of contemporary living and working conditions. Some of the most typical factors include continuous use of mobile phones and computers, working in sedentary jobs, etc. Prolonged incorrect posture and reduced physical activity presents a disbalance in the musculature. Prolonged periods where the head is positioned forward can cause the postural disorder termed "upper crossed syndrome"

Methods: Various databases were extensively searched for articles consisting of clinical trials in humans using Google Scholar, PubMed, Web of science, and Sci Finder, etc. using the keywords such as stretching,strengthening, forward head posture; postural disorders; and rounded shoulder. etc. This review article includes six retrospective years from 2014 to 2019.

Results: All the physiotherapeutic treatments including conventional and recent trends showed a beneficial effect on patient with upper crossed syndrome or postural abnormalities.

Conclusions: Hopefully, this article can provide valuable insights for physiotherapist and researchers to understand better the role of stretching and strengthening in upper cross syndrome among the college students.

Keywords: upper cross syndrome, forward head posture; postural disorders; and rounded shoulder. strengthening exercise,stretching exercise

Introduction

Postural disorders and spinal deformities can be congenital or acquired. Acquired postural disorders can be a consequence, to a large extent, of contemporary living and working conditions. Some of the most typical factors include continuous use of mobile phones and computers, working in sedentary jobs, etc. Prolonged incorrect posture and reduced physical activity presents a disbalance in the musculature (Tiefel, 2012). It can also lead to vision issues, as well as headaches, musculo-skeletal issues and pain, as well as a multitude of other symptoms.

Prolonged periods where the head is positioned forward can cause the postural disorder termed "upper crossed syndrome" (UCS; also: proximal or shoulder girdle crossed syndrome), which includes increased cervical lordosis combined with upper thoracic kyphosis (Kang, Choi, Jeong, Choi, Moon, *et al*. 2018; Arshadi, Ghasemi, & Samadi, 2019). A person

affected by this syndrome typically presents with a forward head posture, rounded shoulders, and scapular winging.

Such posture need not result in pain necessarily; however, if the condition continues over a longer period, this can result in pain in the upper back, neck, shoulders, as well as shoulder blade area. Headaches are very frequent in this syndrome, which can adversely affect one's quality of life (Daneshmandi, 2017).

Based on research and clinical observation, Vladimir Janda identified crossed syndromes in 1979. These syndromes represent a muscular imbalance between the upper and lower extremities. Dr Janda termed one of the syndromes Upper Crossed Syndrome, since weak and shortened upper-body muscles overlap, creating muscle imbalance (Magklaras, 2008)

Stretching has long been a part of athlete training, defined as "… the application of force to musculotendinous structures in order to achieve a change in their length, usually for the purposes of improving joint range of motion (ROM), reducing stiffness or soreness, or preparing for (physical) activity" . Flexibility is the ROM of a joint or a related series of joints, such as the spine. Stretching for increased flexibility tends to be uncomfortable, seeking to enhance stretch tolerance by relatively extreme body positions that put muscles and tendons under unaccustomed tensile stresses . Stretching as a preparatory activity (i.e., warm-up) is clearly not intended to help an athlete "recover" because the stretching precedes the bulk of the training lesson. Stretching to reduce stiffness and soreness is a therapeutic aspect of stretching that is distinct from the other concepts listed above . Thus, the term "stretching" can be somewhat paradoxical by application to several diverse purposes. For example, Kisner and Colby differentiate between stretching and "ROM exercises," with stretching involving tissue tensions and lengths beyond those normally available, whereas ROM exercises seek to keep movements within the current boundaries of tissue extensibility

Stretching can be categorized as active or passive, static or dynamic, and acute or chronic . Active stretching refers to a limb position that places a joint at its extreme ROM by virtue of the tension obtained from agonist muscles (e.g., while standing, raising a straight leg from the hip in flexion using the tension from hip flexors). Active stretching positions are opposed by the antagonist muscles' elastic and viscous resistances (e.g., while standing, raising a straight leg from the hip in flexion is resisted by hip extensor muscles and resistive properties of tendons, ligaments, skin, and fascia). Passive stretching involves placing a joint in an extreme ROM position by the use of gravity or inertia (e.g., a gymnast or dancer sitting in a split position or swinging a limb to an extreme position). Static stretching is the most commonly prescribed type of stretching involving placement of the body and limbs in an extreme ROM position and holding this position for a period by gravity, partner assistance, or agonist muscle tension. Dynamic stretching moves joints through extreme ROM movements without long pauses or holds and momentarily taking a limb to an extreme position (e.g., swinging the leg at the hip, forward and backward in the sagittal plane, momentarily stretching hip flexors and extensors). Acute stretching refers to a single exercise or stretching for a relatively short duration, usually 30 seconds or less . Chronic stretching refers to repeated stretching exercises or sets of exercises over days and weeks.

Materials And Methods

Databases, journals and book Explored

PubMed, Google Scholar, Web of Science, Science Direct, International Journal of Sports Medicine, International Journal of Biosciences, Digital library of Imam Abdulrahman Bin Faisal University, Hindawi, SAGE Journals, and books.

Keywords Searched

Upper cross syndrome,strengthening exercise,stretching exercise, forward head posture; postural disorders; and rounded shoulder.

Review period

The literature review consisted of articles retrieved from retrospective six years i.e., from 2014 to 2019.

Table 1. Inclusion and exclusion criteria

Volume 7, Issue 3; May-June 2024; Page No 593-598

Inclusion Criteria	Exclusion Criteria
Research published in peer-reviewed scientific journals	Sources that cannot be verified or are not scientific publications (for example, blogs, forums or personal websites)
Research relevant to the research topic	Studies that are not directly related to the research topic
Research published in an understandable language (English)	Research that is not available in an understandable language
Research published within a specific time period (last 5 years)	Research published before the specified time period
Research with a methodology that is in line with the research objectives	Research that uses irrelevant or inappropriate methodologies
Research that has a sample that covers a relevant sporting population	Research with irrelevant samples or not covering the appropriate sporting population
Research that provides data and findings relevant to the research topic	Research with data and findings that are not relevant to the research topic
Researchers who have full access to the full text	Research that is only available in abstract or summary form
Research that meets good standards of research quality and integrity	Research that does not meet quality standards or has significant methodological issues

Table 1. Detailed analysis of the papers

Reference	Groups	Participant sample	Exercise program	Frequency and duration	Study design and result
Arshadi, et al., (2019)	EG(n=15) CG(n=15)	A: EG: 21,44±2,06 CG: 20,14±1,71 S: m n=30	EG: Program comprised strengthening, stretching and stabilization exercises. I: 40% of 10RM	TPD: 8 weeks WF: 3 times PD: 50 minutes	EG achieved sig.↑ better results compared to CG, and these exercises can bring about positive effects on UCS.
Park, et al., (2014)	EG(n=20) CG(n=20)	A: EG: 13.55±2.21 2EG: 13.75± 1.80 S: m, f n=40	EG- muscle stretching and strengthening exercises CG- no exercise	TPD: 6 months WF: 3 times	EG: Results show sig.↑ across all measurements compared to CG .
Ali, et al., (2017)	EG1	A:	EG1 – muscle energy	PN: 16	Results presented via NPRS, NDI and G show

Volume 7, Issue 3; May-June 2024; Page No 593-598

	EG2	EG1: 20-50 EG2: 20-50 S: m, f n=52	technique (MET), isometric and stretching exercises EG2 – stretching exercises	WF: 3 times	sig. ↑ for both groups; however, EG1 showed sig.↑ compared to EG2
Kim, et al., (2016)	EG(n=12)	A: EG: 20,8±0,8 S: M: n=6 F: n=6 n=12	EG- exercise program with resistance bands	SN: 3 RN: 15 EN: 7	EG: sig.↑ for PM, sig.↑ for FSA, CVA, UT; other measurements do not show sig.↑.
Bae, et al., (2016)	EG(n=15) CG(n=15)	A: EG: 22.1±2.3 CG: 24.3±2.9 S: m n=30	EG- strength exercises for lower and middle trapezius, and stretching exercises or upper trapezius and levator scapulae CG – no exercise program	TPD: 4 weeks WF: 3 times	EG: DITI shows sig.↑ compared to CG, as do before/ after measurement results within EG.

A-age; S-sex; M-male participants; F-female participants; sig.↑- statistically significant result improvement; n-number of participants; EG1-first experimental group; EG2-second experimental group; EG3-third experimental group; CG-control group; UCS –Upper crossed syndrome; TPD-total program duration; WF-weekly frequency; PD-individual practice session duration; I – intensity; RM– maximum number of repetitions with a given load; PN- number of practice sessions; SN – number of sets; RN – number of repetitions; EN – number of exercises

Results And Discussions

UCS is a common lifestyle disorder associated with the faulty posture and causes pain and postural derangements. In this review authors tried to give awareness about the disease and also tried to give the most reliable and recent physiotherapy treatments from the quality articles. Out of 13 articles screened, 8 met the selection criteria and the management is included based on the quality of the article. Myo fascial release, corrective exercise, stretching and strengthening exercises and MET is shown to be beneficial in upper crossed syndrome. Electrical modalities such as IFT, TENS and electrical stimulation are also the mainstay of treatment

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

Volume 7, Issue 3; May-June 2024; Page No 593-598

myofascial where it develops adhesion and becomes trigger points . 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 . Among all the articles selected these few shows recent advances and trends those are, Shakeel Ahmed et al. 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. 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 . Syeda Nida Gillani et al. 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 . Arif Ali Rana 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. Rasoul arshadi et al. 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.

The most frequently implemented strength exercises included weight exercises and bodyweight exercises, where training loads were gradually increased over the course of the program.The implemented exercises were administered primarily by volume, rather than by intensity. Training volume which had a positive effect consisted of a minimum of three sets per exercise, and no less than eight repetitions. Starting with such a program volume will bring about positive results, on condition that the remainder of the program follows the principle of progressive overload.

Conclusion

The results of this systematic review indicate that, when it comes to upper crossed syndrome, various physical exercise programs affecting the strengthening and stretching of upper back and neck muscles can be applied. The studies analyzed used different exercise programs, such as strength exercises, stretching and stability exercises, exercises for cervical back strengthening, an exercise plan that can be realized at

Volume 7, Issue 3; May-June 2024; Page No 593-598

home, a stretching and isometry exercise program, resistance band exercises, interferential current therapy, relaxation exercises, aquatic exercise, as well as other corrective exercise having a beneficial effect on this syndrome.

Based on the overall analysis, recommended exercise programs include programs for strengthening weakened musculature, or for stretching strained musculature, over a period of a minimum of 4 weeks, with a weekly frequency of 3 practice sessions.

Limitations

This review included only RCTs. The review is not focused on the prevalence of UCS among students and desktop workers as the condition is mostly seen in these populations.

References

1. Mujawar JC, Sagar JH. Prevalence of upper cross syndrome in laundry workers. Indian Journal of Occupational and Environmental Medicine. 2019 Jan;23(1): 54.
2. Kirthika SV, Sudhakar S, Padmanabhan K, Ramanathan K. Impact of upper crossed syndrome on pulmonary function among the recreational male players: A preliminary report. Saudi Journal of Sports Medicine. 2018 May 1;18(2):71.
3. Risaldar P. Comprehensive rehabilitation of a patient with upper crossed syndrome. Journal of Medical Pharmaceutical and Allied Sciences. 2021;10(4):3179-3181.
4. Seidi F, Bayattork M, Minoonejad H, Andersen LL, Page P. Comprehensive corrective exercise program improves alignment, muscle activation and movement pattern of men with upper crossed syndrome: Randomized controlled trial. Scientific Reports. 2020 Nov 26;10(1): 1-1.
5. Jiang F, Luo R, Tang J, Ye Y, Zhao YL. Therapeutic observation of manipulation plus exercise therapy in treating upper crossed syndrome postures of primary school students. Journal of Acupuncture and Tuina Science. 2020 Jun;18(3):231-7.
6. Park KN, Ha SM, Kim SH, Kwon OY. Immediate effects of upper trapezius stretching in more and less tensed positions on the range of neck rotation in patients with unilateral neck pain. Physical Therapy Korea. 2013;20(1):47-54.
7. Rodríguez-Huguet M, Gil-Salú JL, Rodríguez-Huguet P, Cabrera-Afonso JR, Lomas-Vega R. Effects of myofascial release on pressure pain thresholds in patients with neck pain: A single-blind randomized controlled trial. American Journal of Physical Medicine & Rehabilitation. 2018 Jan 1;97(1):16-22.
8. Lee HM. Rehabilitation of the proximal crossed syndrome in an elderly blind patient: A case report. The Journal of the Canadian Chiropractic Association. 2000 Dec;44(4):223.
9. Sohrabi S, Rahimi M, Babaei- Mobarakeh M, Piri H. The effect of eight weeks of Iyengar yoga with an emphasis on spine and shoulder exercises on the upper cross syndrome in middle-aged women. Journal of Modern Rehabilitation; 2021.

Volume 7, Issue 3; May-June 2024; Page No 593-598