



Prevalence of Upper Cross Syndrome in IT professionals

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ABSTRACT

Background

Upper cross syndrome (UCS) is the tightness, over-facilitation, over-excitation of the levator scapulae, pectoralis major and upper trapezius whereas weakness, inhibition, suppression of serratus anterior, deep neck flexors more specifically scalene, middle trapezius, lower trapezius and rhomboids. IT Professionals sit on same place for longer duration of time, due to which they adapt faulty posture which needs to be corrected to prevent further musculoskeletal problems. They keep working for more duration as compared to their normal working hours that results in pain and discomfort. It becomes necessary to make them aware about their good posture, importance of ergonomics and importance of exercises to prevent musculoskeletal problems. Hence, it becomes necessary to study the prevalence of Upper cross syndrome in IT Professionals.

Aim and Objectives

To find the risk factors in IT professional having upper crossed syndrome. To evaluate disability in IT professional using neck disability index questionnaire (NDI). To evaluate pain in IT professional using numerical pain rating scale (NPRS).

Methods and Materials

In this study 100 IT professionals as participants were included. Demographic data including name, age, gender, years of working on computer/laptop, daily working hours on computer/laptop, frequency of break, mode of travel were noted. Neck disability and pain rating were assessed by using Neck Disability Index and Numerical Pain Rating scale, Data were collected and statistically analysed.

Results

Our study noted that participants who were included were gender group distribution for 100 individuals out of which 44% are male and 56% are female, age group distribution for 100 individuals out of which 63% of individuals belong to 25-30 year age group and 25% of individuals belong to 30-35 year age group, neck disability for 100 individuals out of which 67% of individuals have moderate disability and 33% of individuals have severe disability, pain rating of 100 individuals out of which 4% of individuals have mild pain, 26% of individuals have discomforting moderate pain, 66% of individuals have distressing severe pain, 4% of individuals have intensely severe pain.

Conclusion

The study, based on the neck disability index scale concluded that there is a 67% prevalence of upper cross syndrome in IT professionals.

Keywords: Upper Cross Syndrome, tightness, deep neck flexors NDI, NPRS

INTRODUCTION

Upper cross syndrome (UCS) is the tightness, over-facilitation, over-excitation of the levator scapulae, pectoralis major and upper trapezius whereas weakness, inhibition, suppression of serratus anterior, deep neck flexors more specifically scalene, middle trapezius, lower trapezius and rhomboids.^[1] The syndrome mainly arises as a result of muscular imbalance that usually develops between tonic and phasic muscles, tonic muscles are the muscles that most of the time become tight i.e. over facilitated whereas phasic muscles are the muscles of lower activation i.e. they are more towards developing inhibition.^[2,3]

Poor posture cause stress on cervico-cranial and cervico-thoracic junction. Stability of scapulae is reduced due to the altered angle of glenoid fossa and as a result all the movement patterns of upper limb are changed.^[4] People usually sit with position of head in different manners. It depends on various factors which includes musculoskeletal structures, body changes regarding age, cultural customs, motor performances and occupation.^[5]

Relation between upper cross syndrome and bad posture was also 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 poor posture there by leading to muscular imbalance that will yield upper cross syndrome.^[6]

Upper cross syndrome (UCS) for the purpose of this study is defined as “tightness of the upper trapezius, pectoralis major, and levator scapulae and weakness of the rhomboids, serratus anterior, middle and lower trapezius, and the deep neck flexors, especially the scalene muscles.^[7] This syndrome can cause a multitude of dysfunctions within the body including headaches, early degeneration of the cervical spine, and loss of the cervical curve. In addition, UCS can cause an abnormal kyphotic thoracic spine and altered biomechanics of the glenohumeral joint. Altered biomechanics of the cervical spine may lead to a loss of cervical curve and, if not addressed, degeneration of the cervical spine.

Neck disability index questionnaire has been designed to give the information how your neck pain has affected your ability to manage in everyday life. A clinically important change has been calculated as 5 point, with a sensitivity of 0.78 and a specificity of 0.80 [?]. Scores out of 50 where 0-4 is no disability, 5-14 is

mild disability, 15-24 is moderate disability, 25-34 is severe disability, >35 is complete disability.

Numerical pain rating scale (NPRS) is used to rate the level of pain of an individual it scores from 0-10 where 0 means no pain, 1-2 means mild pain, 3-4 means discomforting moderate pain, 5-7 means distressing severe pain, 8-9 means intensely severe pain, 10 means worst imaginable pain.

Individuals who present with upper crossed syndrome will show a forward head posture (FHP), hunching of the thoracic spine (rounded upper back), elevated and protracted shoulders, scapular winging, and decreased mobility of the thoracic spine.^[8] Sometimes, manual material handling activities can cause musculoskeletal disorders^[9], for example, the workers who do their work in inappropriate position and repeating the same action throughout their workday.^[10] The simultaneous occurrence of FHP and rounded shoulder is nothing but upper crossed syndrome.^[11] Musculoskeletal injuries often affect both neck and upper limbs and can occur when performing a given professional activity that is repetitive and involves still posture as well as handling considerable load.^[12] FHP is caused by maintaining an abnormal or inappropriate posture for a long time.^[13] Finally it is recommended that some serious steps should be taken to generate postural awareness in people of all ages especially students.^[14]

Therefore, once muscle dysfunction begins, typical patterns of muscle imbalance and altered posture ensue^[15] The seated posture is a flexor-dominated posture that further shortens and tightens the musculature on the ventral side of the body and lengthens while weakening the musculature on the dorsal side of the body. “As a result of the muscle imbalances that develop in our musculoskeletal system, postural distortions occur that tend to correspond with the muscular findings^[16] Both groups of this musculature are involved in UCS. “The effects of the static posture assumed when working at a visual display terminal are most pronounced in the neck and shoulder regions, resulting in increased forward neck flexion and increased static muscle tension in the region”^[17] The posture of UCS starts in childhood from imbalances of flexor versus extensor musculature. “The habitual neuromuscular strategy creates the joint dysfunction over time, which in turn influences and perpetuates the neuromuscular strategy”^[18] Perpetuation of this muscular imbalance occurs through hours in the

classroom as well as sitting for other activities of daily living.

MATERIAL AND METHODS

A survey-based study is conducted on 100 IT professionals with age group 25-35 years. The participants are selected according to the inclusion criteria exclusion criteria. Inclusion criteria are IT professionals with constantly or frequently occurring neck-shoulder pain, IT professionals having at least 2 years of experience, IT professional having work duration more than 6 hours, IT professionals both male and female were included in the study, IT professionals who are willing to participate. Exclusion criteria are IT professionals having cervicogenic conditions, IT professionals having upper quadrant malignancy, fractures or surgeries, IT professionals having less than 2 years of experience. The aim, objectives and method of study is explained to the participants. Consent is taken on the consent form.

RESULTS

MATERIALS

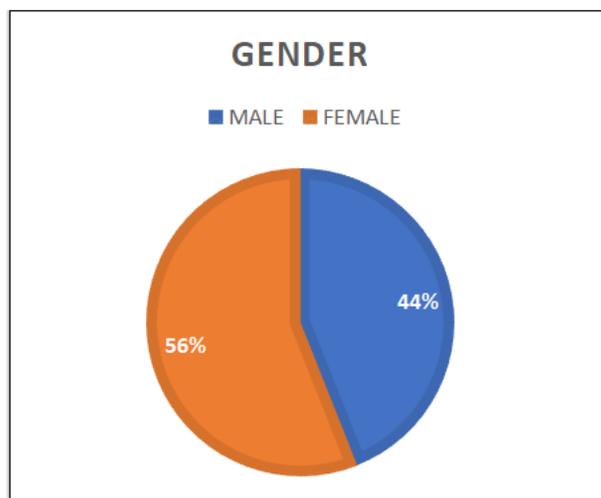
Demographic data form, consent form, pen, laptop, self-constructed questionnaire, Neck Disability Index Questionnaire, Numerical pain rating scale.

PROCEDURE

Permission was approved by institutional ethical committee of Tilak Maharashtra Vidyapeeth, Department of Physiotherapy, Pune. Different people in and around Pune were approached and permission was taken prior to the study. The aims and objectives of the study was explained to all the IT Professional participants. Participants willing to participate in the study were included according to the inclusion and exclusion criteria. Participants willing to give consent to participate in study was included. Demographic data, Neck Disability Index Questionnaire and Numerical Pain Rating Scale was filled by the participants selected. Results was calculated. The interpretation of the scale was noted and was used for statistical analysis.

Table 1: Gender Distribution

| Gender | Total | Percentage |
|--------|-------|------------|
| Male | 44 | 44% |
| Female | 56 | 56% |

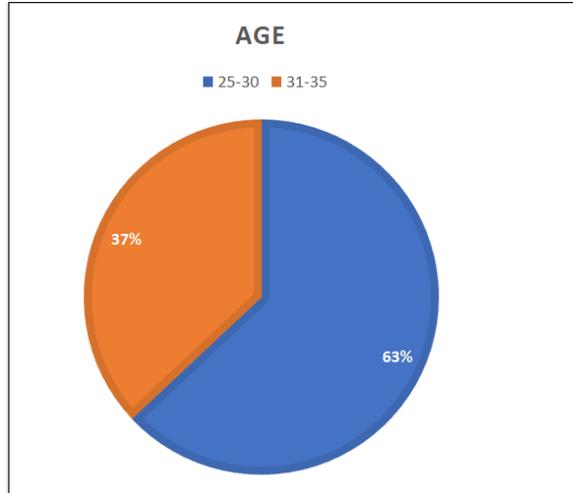


Graph 1: Gender group Distribution

Graph 1 shows gender group distribution for 100 individuals out of which 44% are male and 56% are female.

Table 2: Age Group Distribution

| Age Group | No. of Participants | Percentage |
|-----------|---------------------|------------|
| 25-30 | 63 | 63% |
| 30-35 | 37 | 37% |

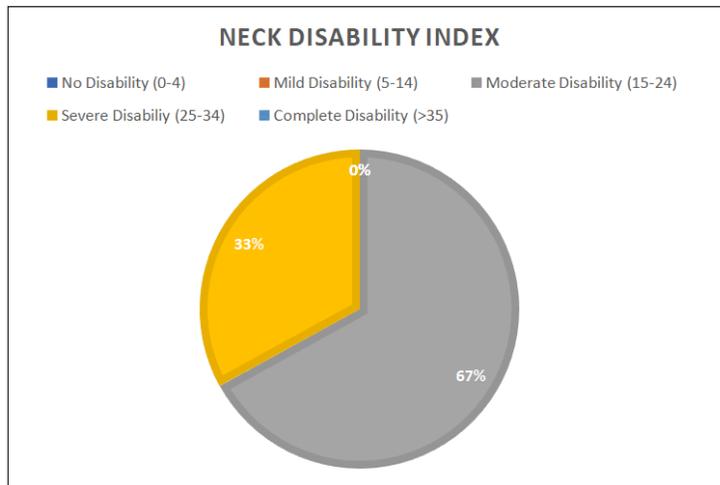


Graph 2: Age group distribution

Graph 2 shows Age group distribution for 100 individuals out which 63% belong to 25-30 year age group and 25% belong to 30-35 year age group.

Table 3: Neck Disability Index Questionnaire (NDI)

| Disability | No. of Participants | Percentage |
|-----------------------------|---------------------|------------|
| No Disability (0-4) | 00 | 00% |
| Mild Disability (5-14) | 00 | 00% |
| Moderate Disability (15-24) | 67 | 67% |
| Severe Disability (25-34) | 33 | 33% |
| Complete Disability (>35) | 00 | 00% |

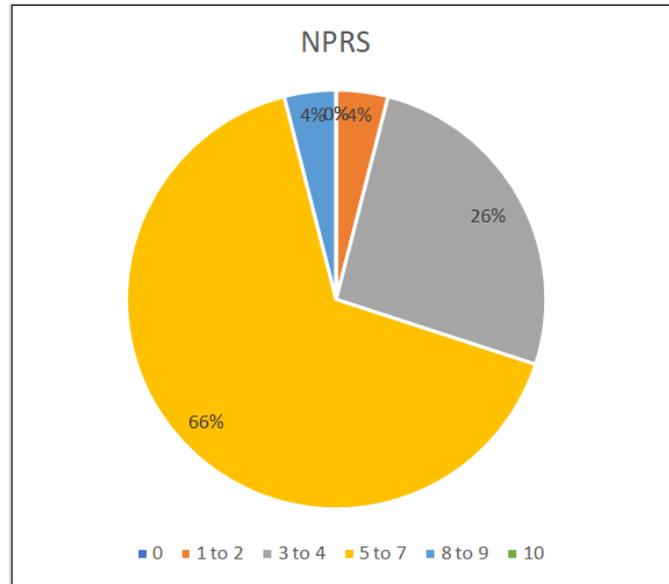


Graph 3: Neck disability Index

Graph 3 shows neck disability for 100 individuals out of which 67% of individuals have moderate disability and 33% of individual have severe disability.

Table 4: Numerical Pain Rating Scale (NPRS)

| Rate | No. of Participants | Percentage |
|--|---------------------|------------|
| 0 (No Pain) | 00 | 00% |
| 1-2 (Mild Pain) | 04 | 04% |
| 3-4 (Discomforting Moderate Pain) | 26 | 26% |
| 5-7(Distressing Severe Pain) | 66 | 66% |
| 8-9 (Intensely Severe Pain) | 04 | 04% |
| 10 (Worst Imaginable Pain) | 00 | 00% |



Graph 4: Numerical Pain Rating Scale

Graph 4 shows pain rating of 100 individuals out of which 4% have mild pain, 26% have discomforting moderate pain, 66% have distressing severe pain, 4% have intensely severe pain.

DISCUSSION

The present study was conducted to find the prevalence of upper cross syndrome in IT professional. In the present study, 117 IT professional responses were fetched out of which 100 responses were selected depending upon the inclusion and exclusion criteria and other 17 responses were dropped out, which included both male and female between the age group of 25 to 35 years.

This study was conducted because being an IT Professional, they have to sit at the same place for longer duration of time, due to which they adapt faulty posture which needs to be corrected to prevent further musculoskeletal problems. They keep working for more duration as compared to their normal working hours that results in pain and discomfort. It becomes

necessary to make them aware about their good posture, importance of ergonomics and importance of exercises to prevent musculoskeletal problems. Hence, it becomes necessary to study the prevalence of Upper cross syndrome in IT Professionals.

Individuals with constantly or frequently occurring neck-shoulder pain were taken as the subjects. Other than this those who had any cervicogenic pain or any history of malignancy were not considered to be the subjects. Individuals having at least 2 years of experience were included. Those who had lesser than 2 years of experience were not a part of this procedure. Both genders male & female had participated in this procedure. Only those subjects were considered who were willing to participate in the study. On the other side, those individuals who had issues while participation were not a part of this research.

The aims and objectives of the study was explained to all the IT Professional participants. Individuals willing to participate in the study were included according to the inclusion and exclusion criteria. The research was surveyed using a google form and filled by the subject selected. Results will be calculated. The interpretation of the scale will be noted and will be used for statistical analysis.

Our study targeted 100 individuals including both the genders out of which 44% of population were recorded as male and remaining 56% of the population seemed to be female. On addition to it the population of age group 25-35 years were included out of which 63% of the population belonged to 25-30 years of age group and 25% of the population belonged to 30-35 years of age group.

Neck disability for 100 individuals was assessed through Neck Disability Index Questionnaire (NDI) which resulted 67% of individuals having moderate disability and 33% of individuals have severe neck disability.

Pain intensity for 100 individuals were assessed using Numerical Pain Rating Scale (NPRS) which resulted 4% of individuals were observed to have mild pain, 26% of individuals were observed to have discomforting moderate pain, 66% of individuals were observed to have distressing severe pain, remaining 4% of individuals were observed to have intensely severe pain.

The prevalence of upper cross syndrome in IT professional was been surveyed through Neck Disability Index Questionnaire (NDI) and Numerical Pain Rating Scale (NPRS). Neck Disability Index (NDI) exhibited excellent reliability is (ICC=0.88 [0.63

to 0.95]) Numerical Pain Rating Scale. (NPRS) [64% validity and exhibited moderate reliability (ICC = 0.67 [0.27 to 0.84]).

Our study concurred with Iqra Mubeen^[36], et.al who conducted a study on Prevalence Of Upper Cross Syndrome Among The Medical Students Of University Of Lahore which concluded that 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 of high physiologic cost there by leading to muscular imbalance that will yield upper cross syndrome and prevalence of upper cross syndrome in medical students of University of Lahore was found to be 37.1%.

CONCLUSION

The study, based on the neck disability index scale concluded that there is a 67% prevalence of upper cross syndrome in IT professionals.

LIMITATION OF STUDY

The study included only individuals having an experience of more than 2 years were targeted.

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REFERENCES

1. Muscolino J. Upper crossed syndrome. *J Aust Trad Med Soc.* 2015;21(2):80-5.
2. Yoo WG, Yi CH, Kim MH. Effects of a ball-backrest chair on the muscles associated with upper crossed syndrome when working at a VDT. *Work.* 2007;29(3):239-44. PMID 17942995.
3. Page P, Frank C, Lardner R. Assessment and treatment of muscle imbalance eBook.2010.
4. Bagg SD, Forrest WJ. Electromyographic study of the scapular ro-tators during arm abduction in the scapular plane. *Am J Phys Med.* 1986 Jun;65(3):111-24. PMID 3717317.
5. Johnson G, Bogduk N, Nowitzke A, House D. Anato-my and actions of the trapezius muscle. *Clin Biomech (Bristol, Avon).* 1994 Jan;9(1):44-50. doi: 10.1016/0268-0033(94)90057-4, PMID 23916077.
6. Moore MK. Upper crossed syndrome and its relation-ship to cervicogenic headache. *J Manipulative Physiol Ther.* 2004 Jul-Aug;27(6):414-20. doi: 10.1016/j.jmpt.2004.05.007, PMID 15319765.
7. Moore MK. Upper crossed syndrome and its relationship to Cervicogenic headache. *JMPT.* Jul/Aug 2004;27(6):416.
8. Introduction to the ergonomics of manual material handling. [Diunduhdari: diakses tanggal maret]; 2012. Public education section Department of Business and Consumer Business Oregon OSHA. Google Scholar.
9. Etika M, Indah P, Rafsanjan F. Diunduhdari: diakses tanggal. *J Ilmiah Tekn Industri.* 5 Maret 2014. Vol. 5; 2006. Analisis Manual Material Handling Menggunakan Niosh Equation. p. 4. Google Scholar.

10. Janda V. Muscles and motor control in Cervicogenic disorders. New York: Churchill Livingstone; 1994. Google Scholar.
11. Buckle PW, Devereux JJ. The nature of work-related neck and upper limb musculoskeletal disorders. *Appl Ergon.* 2002;33(3):207-17. doi: 10.1016/s0003-6870(02)00014-5, PMID 12164505, Google Scholar.
12. Neuman DA. Kinesiology of the musculoskeletal system. 2nd ed. Singapore: Mosby; 2009. Google Scholar.
13. Kumar B. Poor posture and its causes. *Int J Phys Educ Sports Health.* 2016;3:177-8. Google Scholar.
14. Steinmetz A, Seidel W, Muche B. Impairment of pos-tural stabilization systems in musicians with play-ing-related musculoskeletal disorders. *J Manipulative Physiol Ther.* 2010;33(8):603-11. doi: 10.1016/j.jmpt.2010.08.006, PMID 21036282.
15. Tunnell PW. Protocol for visual assessment. *J Bodyw Mov Ther.* 1996;1(1):21-7. doi: 10.1016/S1360-8592(96)80011-8.
16. Hammer W, Soft-Tissue F. Examination and treatment by manual methods. 2007. 3rd,509.
17. Yoo WG, Yi CH, Kim MH. Effects of a ball-backrest chair on the muscles associated with upper crossed syndrome when working at a VDT. *Work.* 2007;29(3):239-44. PMID 17942995.
18. Key J, Clift A, Condie F, Et al. *J Bodyw Mov Ther.* 2008;12:113.

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