PREVALENCE OF UPPER CROSS SYNDROME IN BANKERS OF FAISALABAD, PAKISTAN

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Abstract

Upper cross syndrome is the stiffness and over activation of the muscles of upper back and neck particularly upper trapezius and levator scapulae resulting in the rigidity of these muscles dorsally. The condition is associated with shortness of muscles of chest specially pectoralis major and minor ventrally. The condition is becoming more prevalent among the bankers because of continuous sitting in a hunched over posture while working on computers. Computer usage for longer duration of time and poor postural habits contribute to the problem. A cross sectional study was conducted and a convenient sample of 100 bankers from different banks of Faisalabad city was collected following convenient sampling technique. Self-administered questionnaires were circulated after taking the informed consent. Bankers of age between 24-60 years having upper back and chest stiffness with pain in neck and shoulders were included. Bankers with any recent trauma to upper back, systemic illness, congenital structural deformity and any acute condition were excluded from this study. It was ensured that no individual will be harmed during the study. Data was analyzed by using SPSS version 24.0. Reliability of the questionnaire and response from the participants came out to be 0.767. Mean and standard deviation were calculated for quantitative data. Frequency and percentages were calculated for qualitative data. Upper back pain was found in 34% of the respondents, upper neck pain in 26% of the participants, pain in front of the chest in 9% of the subjects and in arms in 7% of the subjects.Flexed sitting posture was reported in 73% of the participants. Forward head position was found in 21% of the subjects. Headaches were reported in 79% of the participants during work. Poor posture, prolonged sitting and inappropriate ergonomics of the work station were the cause of upper cross syndrome. Prevalence of upper cross syndrome in bankers of Faisalabad came out to be 54.1%.

Keywords: upper cross syndrome, rounded shoulders, upper body work related musculoskeletal disorders, poor upper body posture, muscle imbalance.

1.Introduction

Upper Cross Syndrome is a typical postural deformity that depicts the muscular imbalance of the muscles of the neck, upper back, shoulders and chest region of the body. The condition deduces its origin from the cross "x" shape that develops when areas of hyperactive and hypoactive muscles intersect. One strand of the cross shows the muscles that are excessively encouraged or stiff and the other strand of the cross demonstrates the muscles that are commonly frail or excessively restrained[1]. Upper cross syndrome is the stiffness and over activation of the muscles of upper back and neck particularly upper trapezius and levator scapulae resulting in the rigidity of these muscles dorsally. The condition is associated with shortness of the muscles of chest specially pectoralis major and minor ventrally. Upper cross syndrome is a muscular imbalance predominantly due to a hunched over posture in prolonged sitting like studying with the head in forward position or using computers with neck in forward position [2].Upper cross syndrome (UCS) is common in individuals who work mostly in sitting positions for longer duration of time with the neck in flexed position and shoulders drawn anteriorly. This poor posture is responsible for the formation of a typical cross pattern where some of the muscles become tight and others become weak intersecting each other. This muscular imbalance causes head to pull forward and shoulders in an anteriorly rolled direction and the medial borders of the shoulder blades to protrude outward [3].

Forward head posture and increased neck flexion causes work load of the anterior shoulder girdle and chest muscles to increase resulting in chest tightness, discomfort and even fatigue. Shortened pectoral muscle is one of the causes responsible for rounded shoulder posture. Posterior muscles of the neck are in the continuous position of strain resulting in the stiffness of upper trapezius. Malalignment of scapula or any of its supporting muscles may result in instability and altered biomechanics of shoulder joint. Muscles of the scapula specifically levator scapulae that elevates scapulae is also tightened. Anterior muscles of the neck specifically the deep flexors are weakened due to their inhibition or decreased work load. Weakness of the lower trapezius and serratus anterior is also seen because of their decreased work load or suppression [4]. When the inferior angle of the scapula becomes distant from the spinous process of the vertebra it results in rounded shoulder posture [5]. This causes muscular imbalance and is responsible for musculoskeletal disorders.

1.1 Rationale

Stiffness of upper back, neck and chest is becoming more prevalent in bank officers with most of the bankers having pain in neck and shoulders. They often complain of numbness in their upper limb. The purpose of the study is to evaluate different musculoskeletal related symptoms in upper back, neck, shoulders and chest.

1.2 Objectives

The objective of the study is to determine the prevalence of upper cross syndrome in bankers of Faisalabad city with poor postural habits and to aware bankers the unhealthy consequences of poor posture during banking hours.

1.3 Operational definitions
1.3.1 Upper cross syndrome

Upper cross syndrome is the postural deformity of the muscles of upper back, neck, shoulders and chest. Muscular imbalance causes posterior upper back and neck muscles to become tight and anterior neck and chest muscles to become short and weak.

1.3.2 Posture

Posture is the way a person positions and holds his/her body at rest or during performance of any type of activity.

1.3.3 Muscular Imbalance

Muscular imbalance is a state of disturbed equilibrium between agonists producing muscle contraction and antagonists controlling muscle contraction as well as producing relaxation.

2. Literature Review

Banking system of Pakistan has seen a colossal change in 21st century as a result of globalization, progression and use of technology worldwide. Computers have turned into a vital piece of workplaces [6]. The explanation behind high pervasiveness of musculoskeletal disorders and manifestations can be linked to long-term contribution of static works, lacking rest, and unbalanced stances amid work with computers [7]. Neck pain was the most common work related musculoskeletal problem in individuals who perform their duties in forward flexion posture [8]. Poor postural propensities, neck pain and scapular winging are progressively basic among people who work predominately on computers with poor stances including forward head position and protracted shoulder [9]. Since computer work, prolonged sitting, repetitive tasks and several hours of working are the fundamental tasks of banking in Pakistan, the bankers frequently face musculoskeletal related neck, upper back, shoulders and chest disorders. Musculoskeletal disorders of neck, upper back and shoulders are the most common abnormalities among bankers [10]. Neck flexion posture put strain on the cervical segments of spinal cord that causes headaches referred from upper neck to head named as cervicogenic headaches [11].

Poor posture is common problem in individuals who use computers for longer periods of time in a single siting position leading towards cumulative trauma disorders causing neck and shoulder pain [12]. Maintaining a sustained forward leaning position of the head for longer periods of time causes 3.6 times more force than to maintain it in erect standing posture with the neck and head aligned. Anterior head posture is the anatomical forward displacement of the head away from the midline of the body, where inferior cervical vertebrae are flexed and superior cervical vertebrae are extended, and the weight of the head engaged by the neck is exaggerated [13]. Repetitive tasks and office work on computers that require neck flexion and forward head position end up with hunched over posture[14]. There is global increase in musculoskeletal symptoms among computer users. Occupational risk factors in office workers like poor sitting posture and repetitive manual tasks are leading cause of work related musculoskeletal disorders. Static muscle contraction and prolonged sitting with bent spinal curvatures are a source of discomfort in neck and back[15]. Faulty biomechanics of the body and poor ergonomic design of work station in a computer office may cause neck and upper extremity problems[16].

Improper motor habits and poor body mechanics lead towards increased energy demands by the body to accomplish different tasks. Musculoskeletal abnormalities and poor posture collectively increase the energy demands of the body. Undue changes in the musculoskeletal system of the body disturb the structural organization of the body and are a cause of different abnormal postural patterns. These patterns when developed enough become a source of pain[17]. Prolonged sitting in a flexed posture causes vertebral compression and enhances pressure on the spinal discs causing stress on the ligaments and develop muscular pain[18].

Most of the people who work in sitting position after a certain time tend to adopt the comfortable position. Majority of the people find it comfortable to adopt forward bending position resulting in the altered kinematics of the shoulder joint and scapula. This newly assumed position results in the rounded shoulder posture (RSP). Rounded shoulder posture protracts all the anterior shoulder muscles and causes tightness of the anterior chest and posterior neck muscles resulting in development of upper cross syndrome[19]. Rounded shoulders posture is found mostly in people with flexed sitting and anterior neck position[20]. It is necessary for the computer workers to take rest of at least 15 min after 2 consecutive hours of working[21].

3. Materials and Methods

3.1 Setting
Data has been collected from various banks of Faisalabad city.

3.2 Duration of study
The expected time for conducting the survey and analyzing the results was about 3 months after approval of the study on 25 Oct 2017.

3.3 Study design
It is an observational study. Cross sectional study design has been selected to check for the prevalence of upper cross syndrome among the bankers of Faisalabad city.

3.4 Population
Bank officers were selected as the population of interest because of the frequent computer exposure and prolonged sitting demands of their job.

3.5 Sample size
A sample size of 100 Bankers has been decided after taking the expert opinion. There are almost 89 banks in Faisalabad city according to an online statistics. Number of the bankers in small and large banks on the average was round about 10 with the exception of regional heads where this number was almost 35-50. Total population of bankers in Faisalabad city was estimated to about N=1000 and after taking expert opinion 10% of the total population has been taken as sample that came out to be n=100.

3.6 Sample Selection Criteria

3.6.1   Inclusion criteria

- Bank officers aged between 24-60 years
- Bankers suffering from cervicogenic headaches, neck pain or stiffness, upper back pain or stiffness, shoulder pain or rounded shoulders and chest pain or tightness.

3.6.2   Exclusion criteria

- History of any recent upper body trauma.
- Respondents who were suffering from the acute musculoskeletal conditions.
- Bankers with any congenital postural and structural deformity.
- Subjects with the presence of any acute systemic or metabolic illness.

3.7 Sampling technique

Convenient sampling technique was used. Survey was conducted near the vicinity of Govt. College University Faisalabad. A convenient sample of 100 bankers was taken.

3.8 Ethical considerations

Before conducting the survey participants were briefly informed about the nature and purpose of study. It was ensured that no individual will be harmed during or after the study. Participants were provided with the consent form and data was collected after taking the informed consent from the participants. It was ensured that personal information will remain confidential.

3.9 Data collection

Data was collected form 100 bank officers of different banks of Faisalabad city. Data was collected by circulating self-administered questionnaires SAQ.

3.10 Numeric rating scale

Numeric rating scale was used to determine the intensity of pain.

3.11 Statistical software

SPSS version 24.0 was used to analyze the data. Frequency and percentages were calculated for qualitative data. Mean and standard deviation were calculated for quantitative data.

3.12 Pilot study

A pilot study was conducted by obtaining response from 30 participants of the study. Cronbach's Alpha that shows reliability of the questionnaire and response from the participants came out to be 0.767.

4. Results

Study was conducted on 100 participants. Out of 100 total participants 81% were males and 19% were females. Ages of 92% out of total 100 subjects were between 24-42 years whereas 8% have ages between 43-60 years. Qualification of 53% of the total subjects was MBA, 22% of the participants B.com, 18% of the subjects M.com and 7% had done MPhil. Participants reported that 55% of them were working in banks from 1-5 years, 37% from 6-10 years, 5% from 11-15 years and 3% from 16-20 years.

Out of 100 participants 78% felt pain or stiffness during working hours in banks. Upper back pain was found in 34% of the respondents, upper neck pain in 26% of the participants, pain in front of the chest in 9% of the subjects and in arms in 7% of the subjects. Pain was on both sides among 34% of the participants,

24% have pain on left side and 20% were having pain on right side. Pain was persistent among 35% of the participants from 1-2 months, in 22% from 3-4 months, in 5% from more than 6 months and in 3% from 5-6 months. The mean of pain onset time was 2.625 ± 1.75266 months. Work related stress was cause of pain in 75% of the participants, motor vehicle accident as cause of pain in 4% and traumatic injury as cause of pain in 1%. Pain was occasional in 46% of the participants, constant in 30%, sharp in 2% and throbbing in 1%. Participants were asked to rate the intensity of their pain out of 10 scores. 1 means having mild pain, 5 means having moderate pain and 10 means having maximum possible pain. Out of 100 total participants 37% of the participants rated their pain as moderate, 27% rated pain as level 4, 14% rated pain as level 3, 6% rated pain as level 6, 6% rated pain as level 7, 5% rated pain as level 2, 2% rated pain as level 8, 1% rated pain as level 9, 1% rated pain as maximum possible pain and 1% rated pain as mild pain. The mean of pain intensity was 5.5 ± 1.477 (standard deviation). Pain got worse due to prolonged sitting in 71% of the subjects, due to physical activity in 19% of the participants and due to hunched over posture in 10% of the participants. Headaches were reported in 79% of the participants during work. Sitting was reported as work position in 94% of the participants. Forward head position was found in 21% of the subjects and slightly bent head in 35% subjects. Decreased ranges of motion of neck and shoulder were reported in 49% of the participants. Numbness in the arms was found in 27% of the participants. Pain was radiating in arms in 15% of the participants.

When asked about computer work 71% of the participants reported that they work on computers for 4-5 hours, 19% said they work for more than 5 hours, 5% were working 2-3 hours and 5% for 3-4 hours a day. The mean of computer work was 4.5 ± 0.665 hours. Flexed sitting posture was reported in 73% of the participants. The height of the computer table was reported low by 17% of the participants and high by 10% of the participants. A lot of continuous concentration during work was reported by 81% of the participants. It was reported by 61% of the participants that their work puts them in physically upsetting situation. There were no rest breaks as reported by 82% of the participants during work at banks.

Prevalence of upper cross syndrome in bankers of Faisalabad was found to be 54.1%.

The most common symptoms of upper cross syndrome found in the participants were upper back pain, neck pain, headache, chest pain, arm pain, decreased range of motion of neck and shoulder, forward head position, flexed sitting posture and numbness in the arms.

The valid percentages of these symptoms were as upper back pain 11%, neck pain 8%, headache 24%, chest pain 3%, arm pain 2%, decreased range of motion of neck and shoulder 15%, forward head position 7%, flexed sitting posture 22% and numbness in the arms 8%.

Upper back pain was frequent in 34%, neck pain in 26%, headache in 79%, chest pain in 9%, arm pain in 7%, decreased range of motion of neck and shoulder 49%, forward head position in 21%, flexed sitting posture in 73% and numbness in the arms 27%.

Prevalence of upper cross syndrome in bankers of Faisalabad came out to be 54.1%. This was calculated by dividing the sum of obtained frequencies of diagnostic symptoms by sum of total possible frequencies of these diagnostic symptoms of upper cross syndrome and then multiplying the product with 100.
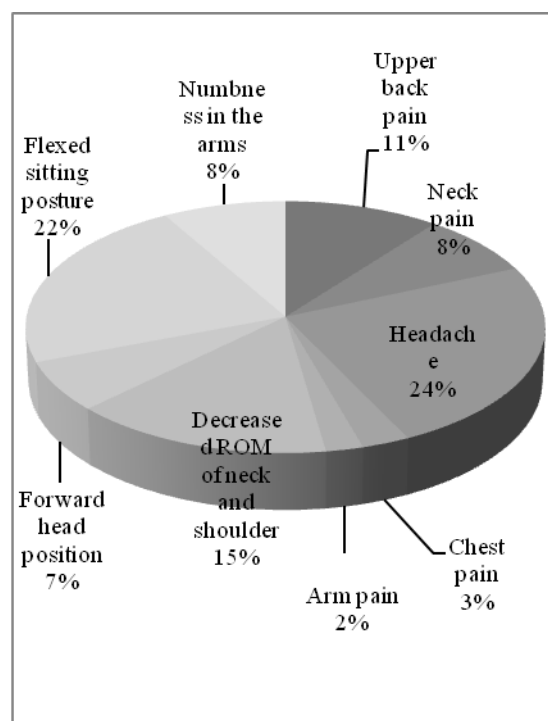
Figure 1 Percentages of Upper Cross Syndrome

Symptoms

Variable	Valid percent	Cumulative percent
Upper back pain	11	11
Neck pain	8	19
Headache	24	43
Chest pain	3	46
Arm pain	2	48
Decreased ROM of neck and shoulder	15	63
Forward head position	7	70
Flexed sitting posture	22	92
Numbness in the arms	8	100
Total	100	

Table 1 prevalence of Upper Cross Syndrome symptoms

Upper back pain, neck pain, chest pain and arm pain were treated as a single variable when considering total possible frequencies of these variables because they fall under one question in the questionnaire. All other variables were separately analyzed out of 100 but these four variables were collectively analyzed out of 100.

5. Conclusion

It was concluded that majority of the bankers were suffering from upper cross syndrome. There is high association between forward head posture, rounded shoulders and upper cross syndrome. Forward head posture and rounded shoulders are strongly linked with extensive computer work. Prolonged sitting, repetitive tasks, computer use and psychological stress due to hectic daily routine make bankers a susceptible population for developing musculoskeletal disorders. Poor posture and faulty ergonomics of the work station in banks are the major contributory factors leading towards variety of musculoskeletal problems. Upper cross syndrome in bankers is the result of poor posture, poorly designed work station, prolonged sitting, extensive computer use and psychological stress of workload.

6. Recommendations

Study was conducted in Faisalabad, Pakistan near vicinity of Govt. College University. Due to limited sources study was confined to Faisalabad, Pakistan. This study can be extended to different cities of Pakistan and worldwide. A convenient sample of 100 bankers was selected due to shortage of time, limited sources and easy access of the researcher to the banks near the university. Results could be more accurate if the sample size were more than 100 bankers. The study was an observational survey to check for the prevalence of upper cross syndrome. It didn't include any treatment trials. Further studies on upper cross syndrome can be done that can include treatment methods as well. This study can be expanded to check prevalence of upper cross syndrome in other office workers and IT officials. Upper cross syndrome can be preventedby simply taking care of the posture during work and avoid using faulty biomechanics to accomplish repetitive tasks. It was found that poor posture, prolonged sitting and inappropriate ergonomics of the work station were the cause of upper cross syndrome. It is recommended to study the posture correction strategies and ergonomics of the work station in banks in order to prevent upper cross syndrome. It is recommended to change the shift of bankers during working hours. This will allow them to take rest and avoid undue exertion causing fatigue and pain. Special workshops must be arranged to aware bankers of good body mechanics and posture during banking hours.

Acknowledgements

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