Frequency of Computer Vision Syndrome in Computer Users

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Purpose: To determinethe frequency of computer vision syndrome in computer users.

Study Design: Cross sectional descriptive study

Place and Duration of Study: Departmentof Ophthalmology, AbbasiShaheed Hospital and Department of Community Medicine, Karachi Medical and Dental College from May 2015 to October 2015.

Material and Methods: Computer users who work on computers for 3 hours continuously per day or more, working for last 1 year or more, ages between 18 to 50 years were included by simple random sampling technique.Nonconsented subjects, diagnosed with neurological problems, diagnosed eye diseases and using any topical eye drops were excluded.

Results: Total of 150 subjects were recruited in which 120 (80%) were males and 30 (20%) females. Their age range was between 18 to 50 years with mean age of 32.9 ± 10.3. Computer vision syndrome was present in 75% of them. Headache was the most common symptom.

Conclusion: Computer vision syndrome is common in computer users of our community. Thesesymptoms can be avoided and relieved by simple modifications during computer use.

Key Words: Computer vision syndrome, computer users, Headache, eye strain.

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In this age of modern technology, the influence of computers on human lives cannot be denied. We are in twenty-first century and computers are used globally as the humble pen and paper in many people's everyday life. The number of computers is increasing all the time. It has been assessed that there are nearly six computers per thousand populations with an installation of 18 million personal computers (PCs)[1]. Computer is a vital tool in every aspect of life. Although these advances are good task performers but they also affect health in terms of stress, postures, health performance and productivity[2].

An American Optometric association has definedcomputer vision syndrome (CVS) as a complex of eye and vision problems associated with the activities thatstrain the near vision. It is experienced in relation to or while using the computers for longer durations[3].Digital electronic screens have become portable and can be used in any location. It is no longer limited to desktop computers in the workstations. Currently visual necessities include not only viewing laptops and tablet computers but also other electronic gadgets like electronic book readers, note books and smartphones.Furthermoreits use is not restricted to adults only[4]. Visual symptoms like eye strain, headaches, ocular discomfort, diplopia, burning sensation and blurred vision are experienced by 90% of computer workers either when looking at near or into the distance after continued and extended computer use[5].This happens even if duration of use is more than 3 hours[6]. Symptoms of computer vision syndrome occur in approximately 75% to 90% of computer usersbutonly 22% of computer workers report musculoskeletal disorders[7]. It has been referred by some optometrist as a possible occupational epidemic of the 21[1st] century[8].

In our country little work has been done on this subject and most of the work is published in nonmedical journals with their focus on ergonomics of work places. This study will be an initiative to create awareness among doctors and support future prevention of computer vision syndrome to help computer workers.

MATERIALS AND METHODS

This study was conducted in the department of Ophthalmology, AbbasiShaheed Hospital, Karachiand department of community medicine, Karachi Medical and DentalCollege (KMDC). It was aprospectiveand a cross sectional descriptive study which was started in May 2015 and completed in October 2015. It was started after approval from the Ethics Research committee of KMDC. Sample size calculatedwere 132[9] with help of WHO software with 5% margin of error, 95% confidence interval. We recruited 150 cases to avoid type 2 error. Sampling technique was simple random sampling.

We included computer users who work on computers for a minimum of 3 hours continuously per day or more, working on computers for last 1 year or more, ages between 18 to 50 years. We excluded those who werenon consented, diagnosed with neurological problems, diagnosed eye diseases and using any topical eye drops.

Data was collected by the data collectors on a self-administered questionnaire in English language. These subjects were college students and employees of multinational companies, banks based on inclusion and exclusion criteria with their consent.Incompletequestionnaires were not entertained. They were assured about the confidentiality and anonymity of the information attained in the proforma. It included their demographic details along with history of any visual problems related to prolong use of computers. Data was analyzed on statistical package for social sciences [SPSS] version 21. Descriptive statistics was used to calculate mean and standard deviation. Frequencies were calculated of various symptoms along with the percentages.

RESULTS

In this study we had 120 (80%) males and 30 (20%) femalesout of a total of 150 computer users. Their age ranged between 18 to 50 years with mean age of 32.9 ± 10.3. Frequencies of their demographics are shown in table 1 like occupation, level of education, marital status, addiction, spectacles, contact lens, duration of

Table 1: Demographics of Subjects.

Variables	No.	%
Mean Age Min Max	32.9± 10.3 18 50	
Gender Males Females	120 30	80 % 20 %
Occupation Student Service/Employee	32 118	21% 79%

Marital Status		
Married	89	59.3 %
Unmarried	61	40.7 %
Level of Education		
Secondary	23	15 %
Graduates	72	48 %
Postgraduates	55	37 %
Addiction		
Smokers	25	17%
Nonsmokers	125	83%
Spectacles		
Yes	82	55%
No	67	45%
Contact Lenses		
Yes	10	7%
No	140	93%
Exercise		
Yes	40	27 %
No	110	73%
Working Stress		
Yes	98	65%
No	52	35%
Duration of Sleep		
Less than 8 Hrs	112	75%
More Than 8 Hrs	38	25%
Hypertension		
Yes	28	19%
No	121	81%
Duration of Computer Use		
3-4 Hrs	28	19%
4-6 Hrs	34	22%
>6 Hrs	88	59%
CVS	113	75%

Headache	69	46%
Tired Eyes	67	45%
Neck Pain	62	41%
Burning Eyes	43	29%
Blurring Vision	36	24%
Watering Eyes	35	23%

sleep and duration of computer use etc. with their percentages. Frequency of computer vision syndrome (CVS) calculated was 75%.

Table 2 shows frequencies of various symptoms like headache, tired eyes, watering of eyes, redness of eyes, blurred vision, and neck pain in subjects suffering from computer vision syndrome. Most common symptom was headache i.e. in 69 (46%) of subjects, it was followed by tired eyes in 67 (45%) of the subjects. Least common symptom was watering of eyes (23%).

Table 2: Frequencies of CVS Symptoms.

Symptoms	No.	%

DISCUSSION

In our study we had total of 150 respondents who filled the questionnaire. Majority of the respondents were males (80%), since the data was randomly collected from different offices and colleges. In offices of thismetropolitancitymost of the workers are still males due to cultural trends of our society. Toama et al., in their study stated that the percentage of females with CVS was more as compared to males[10].Since we have few females our data does not support positive association of CVS with female gender. In our study office workers were 79% and remaining 21% were students. Mean ages of the subjects was 32.9 ±10.3 due to less number of students. Our study reported computer vision syndrome to be 75%. Another study conducted in Islamabad reported CVS in only 25% of office workers and students [9]. Increase in frequency of CVS in our study could be due to more office workers than students and with increase in mean age of subjects.One of the study conducted in Malaysia revealed CVS to be 63%[11]but another study[12]from Nepal revealed CVS in 89.9%. The former one included office workers but the latter one included children less than 10 years of age with large sample size.Prevalence of CVS was 69.3% in university students of Chennai[13] and 75% reported by Madhan[14]. The incidence of CVS vary from place to place but the point on which every study agrees isthat longer a person works with the computer, the more visual discomfort complaints he experiences[9-14].

Asthenopic symptoms noted by Sheedy et al[5]comprised of eye strain,tiredness of eyes, discomfort, burning, irritation, pain, aching, soreness of eyes, diplopia, photophobia, blurring, itching, watering, drynessand foreign body sensation.However they can be broadly divided into two groups[15]. First group called external symptoms are related to dry eyes and they consist of irritation, burning, watering and dryness of eyes. The second group termed internal symptoms are due to refractive,

vergence and accommodative anomalies. It comprised of eye strain, eye ache, headache, diplopia and blurring of vision. Asthenopic symptoms were common in our subjects which were tired eyes (45%), burning (29%) and watering (23%) Sen et al[16] documented 87% with eye fatigue, 55% of subjects with burning sensation and 46% with redness in their eyes[11]. Talwar et al reported redness 40% cases[17]. Causative factors responsible are decrease rate of blinking, environmental causes like use of air conditioners, heating, low humidity, exposure of cornea due to high degree of gaze while viewing desktop monitor, advancing age and in females[8]. There is a progressive decrease in mean blink rate from 22 per min in relaxed state to 10 per min when reading a book and 7 per min on the video display terminal[18].

A person experiencing blurred visionat near or looking far away afterextendedwork at computer is most frequent symptom related to CVS. This is due to an impreciseaccommodative response while working at computers or an inability to relax accommodation entirely following the near-vision strain. Symptoms of the patients are commonly related to near vision activities and inappropriate accommodative responses. Under or over accommodation in relation to the viewing objectarebasis of asthenopia[19]. Our 24% of the subjects complained of blurred vision, 46% had headache and 41% had neck pain.Talwar et al reported blurred vision in 13.2% and headache in 46% usersin his study. Additional factors responsible are dimly illuminated surroundings, glare on the computer display, inappropriate viewing distances from the screen, bad postures, uncorrected or over corrected refractive errorsand a combinationof these reasons[20].

CVS can be managed adequately with help of anophthalmologist and modifications in work place environment[21,22]. Correction of refractive error and dry eye can be easily managed by a visit to an ophthalmologist. Frequently blinking is advised. Proper lightening at work place and proper positioning of monitor,seating posture should be taken care of.There should be breaks for rest which is20/20/20 rule.It states that after every 20 minutes of viewing at computer screen, one should redirect gaze far away at a distance of 20 feet and keep directed for 20 seconds for eyes to refocus. Another recommendation by The American optometric association is interruption of 15 minutes after every 2 hours of continues computer work. Fortunately computer use doesn't cause any permanent damage but temporary discomfort reduces the efficiency of work and thereby productivity[23].

Limitation of the study is its sample size. Additional information could have been retrieved if equal number of males, females and students, office workers were considered. Other studies should be carried out regarding ocular examinations of people suffering from computer vision syndrome.

CONCLUSION

We concluded from our studythat computer vision syndrome is quite common in computer users of our community. We need to create awareness among doctors and computer users about it. These symptoms can be avoided and relieved by simple modifications during computer use.

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REFRENCES

1. **Sharma AK, Khera S, Khandekar J.** Occupational health problems and role of ergonomics in information technology professionals in national capital region. Indian J Community Med. 2006; 31: 36–8.
2. **IM Jomoah.** Work related health disorders among Saudi Computer users. Scientific World Journal 2014;
3. **Barar A, Apatachioaie ID, Apatachioaie C, Marceanu-Brasov L.** Oftalmologia. 2007; 51 (3): 104-9.
4. **Rosenfield M.** Computer vision syndrome: a review of ocular causes and potential treatments. Ophthalmic and Physiological Optics, 2011; 31: 502–515.
5. **Sheedy JE, Hayes J & Engle J.** Is all asthenopia the same? *Optom Vis Sci.* 2003; 80: 732–739.
6. **Horgen G, Aaras A, Kaiser H, Thoresen M.** Do specially designed visual display unit lenses create increased postural load compared with single-vision lenses during visual display unit work? Optom Vis Sci. 2002; 79 (2): 112–20.
7. **Anshel JR.** Visual ergonomics in the workplace. *AAOHN.* 2007; 55 (10): 414-420.
8. **Blehm C, Vishnu S, Khattak A, Mitra S, Yee RW.** Computer vision syndrome: a review. Surv Ophthalmol. 2005; 50 (3): 253-62.
9. **Ellahia A, Khalilb MS, Akram F.** Computer users at risk: Health disorders associated with prolonged computer use. E. J. Bus. Manage. Econ. 2011; 2 (4): 171-182.
10. **Toama Z, Mohamed AA, Hussein NA.** Impact of a guideline application on the prevention of occupational overuse syndrome for computer users. J Am Sc. 2012; 8: 265–82.
11. **Huda Z, MohdIssa M.** Effect of Human and Technology Interaction: Computer Vision Syndrome among Administrative Staff in a Public University. International Journal of Business, Humanities and Technology, 2014: 4 (3).
12. **Reddy SC, Low CK, Lim YP, Low LL, Mardina F, Nursaleha MP.** Computer vision syndrome: a study of knowledge and practices in university students. Nepal J Ophthalmol. 2013; 5 (10): 161-168.
13. **Arumugam S, Kumar K, Subramani R, Kumar S.** Prevalence of Computer Vision Syndrome among Information Technology Professionals Working in Chennai. World Journal of Medical Sciences, 2014; 11 (3): 312-314.
14. **Madhan MR.** Computer Vision Syndrome. The Nursing Journal of India, 2009; 10: 236–237.
15. **Stella CI, Allen EA, Olajire BA.** Evaluation of Vision-Related Problems amongst Computer Users: A Case Study of University of Benin, Nigeria. Proceedings of the World Congress on Engineering, 2007; 1: 2–4.
16. **Sen A, Richardson S.** A study of computer-related upper limb discomfort and computer vision syndrome. J Hum Ergol. 2007; 36: 45–50.
17. **Talwar R, Kapoor R, Puri K, Bansal K, Singh S.** A Study of Visual and Musculoskeletal Health Disorders among Computer Professionals in NCR Delhi. Indian J Community Med. 2009; 34: 326–8.
18. **Tsubota K, Nakamori K.** Dry eyes and VDTs. N Engl J Med. 1993; 328: 584-5.
19. **Birnbaum MH.** Optometric Management of Nearpoint Vision Disorders. Butterworth-Heinemann: Boston, 1993; 121–160.
20. **KhalajM, Ebrahimi M, Shojai S, Bagherzadeh R, Sadeghi T, Ghalenoei M.** Computer Vision Syndrome in Eleven to Eighteen-Year-Old Students in Qazvin. Biotech Health Sci. 2015; 2 (3).
21. **Wimalasundera S.** computer vision syndrome. Galle Medical Journal, 2006: 11 (1).
22. **Barthakur R.** Computer Vision Syndrome. Internet Journal of Medical Update, 2013; 8 (2): 1-2.
23. **Logaraj M, Madhupriya V, Hegde SK.** Computer Vision Syndrome and Associated Factors among Medical and Engineering Students in Chennai. Ann Med Health Sci Res. 2014; 4 (2): 179–185.