Original Article

Computer Vision Syndrome Prevalence and Associated Factors Among the Medical Student in Kist Medical College

Basnet Anjila,[1] Basnet Pragya,[1]Karki Poojyashree,[1]Shrestha Shriraj[2]

[1]*Department of Ophthalmology, KIST Medical College and Teaching Hospital, Lalitpur, Nepal*
[2]*Department of Orthopaedics, KIST Medical College and Teaching Hospital, Lalitpur, Nepal*

ABSTRACT

Introduction: Computers and other visual display terminals are now an essential part of our daily life. In the present era, use of computer has increased many folds, and its use has been associated with increased health risks, especially eyes.

Materials and Methods: This hospital-based prospective, observational, descriptive study. "Specific Computer Users Questionnaire''regarding the visual symptoms was put used. Schirmer's test –I, and Tear film break up time were evaluated in all students.

Results: Among 100 medical students 74% of the medical students sampled who used to spend 2 hours or more on their digital screens on a daily basis were complaining of one or more of CVS manifestation. Eye strain, burning eyes, neck, shoulder, or back pain, dryness, irritation and redness of eyes, headaches during or after working on computer and overall body fatigue were recorded in 89%,87%,78%,77%,71%and 68% respectively. Dry eye was associated with CVS in 58 % in right eye and 55% in left eye according to-Tear film break up time measurement whereas 59 % students have dry eye in right eye and 57% students have dry eye in left eye according to Schirmer's test – I measurement.

Conclusions: Symptoms of CVS increase with increased duration of working on digital screens for 2 hours or more. The factors associated with the severity of CVS were hours of digital screens use per day and dry eye.

Keywords: Computer vision syndrome, Tear film break up time, Visual display terminals

Correspondence:
Dr. Anjila Basnet, MBBS, MS
Lecturer , Department of Ophthalmology
KIST Medical College and Teaching Hospital,
Lalitpur, Nepal
ORCID ID: 0000-0003-2647-0169
Email: dranjilabasnet@gmail.com

INTRODUCTION

In the present era, use of computer has increased many folds, and its use has been associated with increased health risks, especially eyes. Computer Vision Syndrome is a relatively new entity described as a symptomatic complex of various eye and vision- related problems resulting from prolonged computer use. It is caused by multiple factors which include response and time ergonomic factors, individual response and time spent by individual on computer.[1] People who spend more than two hours on a computer each day or more than 15 hours per week will experience visual symptoms including eye strain, tired eyes, irritation, burning, redness, blurred vision and double vision. These symptoms have been together to form a syndrome known as the Computer Vision Syndrome(CVS).[2] The major contributors to the CVS is thought to be the dry eye, the visual effects of video

Table 1: Distribution of the most common symptoms of CVS among 100 individuals

Presenting Symptoms	Percentage
Eye strain	89%
Burning eyes	87%
Neck, shoulder & back pain	78%
Dryness, Irritation & redness of eyes	77%
Headache during or after working at computer	71%
Overall body fatigue	68%

Table 2: Distributions of Tear film break up time in 100 participants with CVS

Tear film break up time in seconds	Right eye (n)	Left eye (n)
>10 sec	42	45
<10 sec	58	55

Table 3: Distribution of Schirmer's test –I in students with CVS

Schirmer's test in mm	Right eye (n)	Left eye (n)
>15	41	43
10-15	34	30
5-10	20	21
<5	5	6

display terminals such as lighting,glare,display quality , and refresh rates, radiation and positioning of computer monitors. Dry eye may be a primary cause of CVS since both significantly reduced blink rate and increased corneal exposure have been observed during computer operation.[3] The current study aims to define the prevalence and associate factors of CVS among the medical students.

MATERIALS AND METHODS

This hospital based prospective, observational descriptive study was carried out in OPD in Kist Medical College and Teaching hospital, Lalitpur, Nepal from 2nd April 2018 to 15th April 2018 (erratum 1st March 2019 - added from 2nd April 2018 to 15th April 2018). Permission from institutional review board has been obtained. One hundred medical students of KISTMCTH included in this study. Diagnostic criteria for dry eye required these students to test positive for 2 following tests:
• Schirmer test- I measuring < 15mm
• Tear film break up time measuring < 10 seconds
 "Specific Computer Users Questionnaire"4 regarding the visual symptoms was put forward and answers were noted. Schirmer's test –I and Tear film break up time was evaluated in all students. Data was collected in a single sitting and the standard performa was filled up during examination of students. Differentvariables were recorded from the standard performa. Final data analysis was done using statistical tools SPSS statistics vs 25.

RESULTS

This study included 100 medical students comprising of 64 (64%) male and 36 (36%) female. Fifty five students (55%) of the students were using Tablet/Ipad/mobile, 20% were using laptops only, and 25% were using more than one type of digital screen. Regarding the time spent by the medical studentson their digital screens, 26% of the students used to spend 1-2 hours, 42% of the students used to spend 2-4 hours, 24 % of the students used to spend 4-6hours, and 8% of the students used to spend > 6 hours on their digital screensas shown in table 3. 74% of the medical students who used to spend 2 hours or more on their digital screens on a daily basis complained of one or more of CVS manifestation. When the symptoms related to CVS was inquired, most of the students gave positive history of one or more symptoms as shown in table 1.

The occurrence of dry eye among students with CVS was 58 % in right eye and 55% in left eye   according to the Tear film break up time measurement that had appearance of dry spot less than 10 seconds as shown in table 2.

This study showed that 59 % students have dry eye in right eye and 57% students have dry eye in left eye according to Schirmer's test – I   measurement as shown in table 3. Most frequently encountered Schirmer's test –I in right eye was 10-15mm in 34% students and in left eye was 10-15 mm in 30% participants.

DISCUSSION

Nowadays, modern life style obliged the whole world to shift to the modern technology where the digital screens are the masterpiece of this life process. The emergences of portable and handheld digital screens have multiplied the number of devices used by human kind hundreds of times. In the last decade, the emergences of the social medias and its applications such as Facebook, Twitter, WhatsApp, You Tube and other social medias have made a revolution in the life style of all mankind who shifted his interest towards entertainment, communications and watching audio-video medias that unfortunately have been consuming most of his spare time on smart phones and digital screens. The U.S. National Institute of Occupational Safety and Health (NIOSH) defined CVS as "eye strain associated with prolonged computer use", and the American Optometric Association (AOA) expanded this definition to those "eye and vision –related problems related to near work which are experienced during or related to computer use"

In a comprehensive national survey on the prevalence of CVS in computer office workers from a South Asia Country by Rana singh et al, one year prevalence of CVS was 67 percent.[5] Another study among medical and engineering students in Chennai has found a higher prevalence of CVS (80.3%),[4] where as a study among keyboard users in Mauritius has found a lower prevalence of CVS (59.9%).[6] According to the study conducted by Iqbal et al, 86% of the medical students who used to spend 3 hours or more on a computer in a daily basis were complaining of one or more of CVS manifestation. Dry eye, headache, blurred vision, eye strain, neck & shoulder pain, and redness of eyes was recorded in 28%,26%,31%,16%, and 24%, respectively.[7]

The most frequently reported symptoms of CVS, in order by rank 8 are "eye strain, headache, blurred vision, dry or irritated eyes, neck and back pains, photophobia and double vision". Eyestrain is the most common form of repetitive stress injury, [9] and leads to the asthenopic CVS symptoms.

This study included 100 medical students comprising of 64% male and 36 % female. Similar study conducted by G S Shrestha

et .al,[10] had more male were more than female participants (69.7% vs. 30.3%). In our study 55% of the students were using Tablet/Ipad /mobile, 20 % were using laptops only and 25 % were using more than one type of digital screen.

The prevalence of visual symptoms increased significantly in individuals who spent more than 3 hours daily working on computer.[11] In this study, 26% of the students used to spend 1-2 hours, 42% of the students used to spend 2-4 hours, 24 % of the students used to spend 4-6 hours while 8% of the students used to spend > 6 hours on their digital screens. The most remarkable result in this study was recording that 74% of the medical students sample who used to spend 2 hours or more on their digital screen on a daily basis and were complaining of one or more of CVS manifestation.

The most frequently occurring symptoms in this study are eye strain (89%), burning eyes (87%), neck, shoulder or back pain (78%), dryness, irritation and redness of eyes (77%), headaches during or after working at computer (71%), and overall body fatigue (68%). The study conducted at TNC hospital, Tilaknagar, Delhi[12] had reported that the commonest symptoms are eye strain (97.8%), headache (82.1%), tiredness and burning sensation (79.1%), watering (66.4%), and redness (61.2%) which is similar to this study.

A study done by Dumeryl A et al[13] had shown that using VDT causes the decrease of blink rate, thereby, more evaporation, and, this in turn, produces the dry eyes and eyestrain. The study by Shrestha GS et al[10] had also shown dry eye in 61.8% in VDT users in Nepal.In this study occurrence of dry eye among students with CVS was 58 % in right eye and 55% in left eye according to Tear film break up time measurement whereas 59% students have dry eye in right eye and 57% students have dry eye in left eye according to -Schirmer's test– I measurement. The study by Singh S et al[14] has also revealed the occurrence of dry eye in CVS significantly in their study when they measured the Tear film break up time and Schirmer's test –I.

CONCLUSIONS

Computer vision syndrome, is a group of eye and vision related problems that results from prolonged computer use. The most remarkable result in this study was recording that 74% of the medical student's sample who used to spend 2 hours or more on digital screens on a daily basis complainedof one or more of CVS manifestations. This study recorded that eye strain, burning eye, neck, shoulder or back pain, headache during or after working at computer and overall body fatigue were the most common CVS symptoms. It is desirable that a multicenter study be conducted in our country to assess the impact of the disease and to better understand the factors associated to the CVS.

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