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Original Article

Comparison of blinking rate in glasses wearing and non glasses wearing computer vision syndrome patients

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BACKGROUND: Dry eye is the one of the major cause associated with corneal erosion due to decrease blinking rate. This study evaluates the blinking rate in patients visiting Mayo Hospital Lahore.

OBJECTIVE: To compare the blinking rate in normal individuals who use computer or smart phone etc. for prolonged periods daily.

PATIENTS AND METHODS: 176 Persons of all age groups above 16 years, using computer in routine work visiting Mayo Hospital and students of College Of Ophthalmology And Allied Vision Sciences were included in this study. The blinking rate per minute was recorded.

RESULTS: The mean blinking rate is 13.28 ± 7.372 (SE. 0.790) and 14.60 ± 4.587 (SE. 0.486) without glasses and with glasses respectively. Mann Whitney-U test showed marked statistically significant difference between blinking rate / minute with glasses and without glasses. ($p=0.004$). However, the blinking rate is decreased with glasses as compared to the without glasses.

CONCLUSION: It is concluded that there was marked difference between the blinking rate with and without glasses ($p < 0.05$). The blinking rate per minute is increased with the increase in usage of computer per hour while those who wear glasses experience increased blinking rate.

INTRODUCTION:

The viewing of digital electronic screens isn't any longer restricted to desktop computers. Today's visual necessities might embody viewing laptop computer and electronic book readers and smart phones either within the work at home or within the case of transportable instrumentality in any location.[1] A recent survey shows that there is about 28.7% population of world is internet user (77.4% of the population of North America to 10.9% of Africa).[2] In another survey about computer usage per day, it is reported that each child in America spent about 1.5 hour on computer per day.[3] The use of these devices has made easy access to information, writing articles and communication to others.[4]

Rechichi and Scullica have shown that visual discomfort is highly associated with the degree of slop and height of monitor screen. It has a great influence on the visual function for men and women, both.[5] In the modern era, the use of electronic devices for both professional and non-professional use like e-email and for entertainment is worldwide. The recent survey has shown that about 45% of the total world's population is associated with use of such electronic devices including computer. Millions of people including children, college student are using computers for many hours per day.[4] The recent investigation has also shown that the children between 8 to 18 years mature reported that in an average day they spend about 5 hour in using entrainment media devices.[1]

The symptoms associated with the computer user are following:[4]

- Eyestrain.
- Tired Eyes
- Headache
- Blurred Vision
- Irritation
- Burning Sensation
- Redness
- Double Vision
- Neck pain
- Backache

In India about 48.7% computer user are suffering from asthenopic symptoms.[6] Like India, in Italy also more than 31% computer users complaint about such disturbance, they facing in their daily routine work.[7] The symptoms of computer vision syndrome such as eye fatigue have some common causes that should be considered seriously. To identify the cause and proper treatment can result in improving performance of the patient and reduce the ocular problem risks. With increasing computer use by children, they are also experiencing such visual symptoms.[8]

In recent survey it is observed that the blink rate is reducing with the font size and contrast[9] / cognitive demands of the task increases.[10 - 12]

In this study we will endeavour to find out the blinking pattern in people associated with computer vision syndrome.

PATIENTS AND METHODS:

This comparative cross sectional study was conducted at Mayo Hospital and College of Ophthalmology and Allied Vision Science (COAVS) Lahore from September to December 2015. 176 Patients were selected from Mayo Hospital OPD and student of COAVS. (89 glasses wearer and 88 non glasses wearer) of all age groups using computer on daily basis (above 16)

Vision of all the subjects was checked using a distance log MAR visual acuity chart. Individuals below 16 years and those who could not give history or unable to perform examination were excluded from the study.

Before the start of research, the objectives and the process of research were explained to them in detail. They assured full cooperation in carrying out research.

Retinoscopy and subjective refraction were done in the individuals wearing glasses and recorded blinking rate per minute of all subjects. The data was recorded on the Performa, fed on the computer using the SPSS 13.0 software. The results were analyzed and tabulated using the same software.

RESULTS:

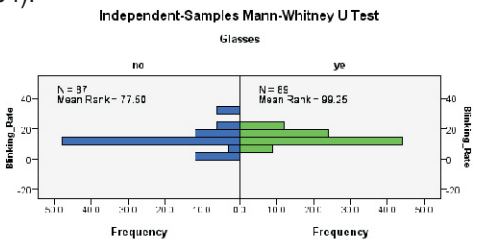
The data was arranged in tabulated form as well as graphical for the analysis of variables. We selected the individuals of age above 16 years of either sex.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Blinking_Rate is the same across categories of Glasses.	Independent-Samples Mann-Whitney U Test	.004	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

This table shows that there is marked difference of blinking rate between spectacles wearer and non spectacles wearer (p=0.004).

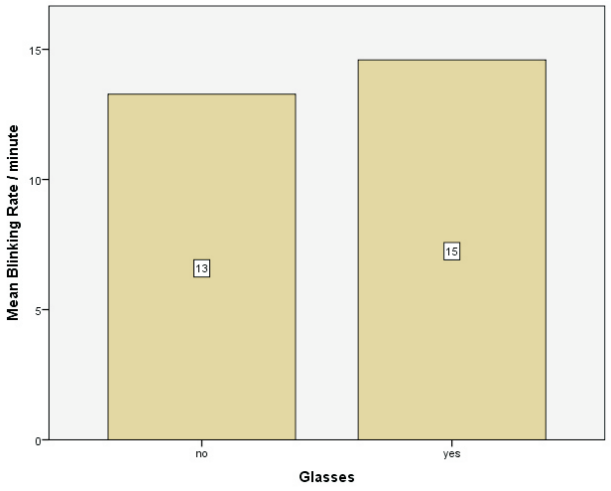


Total N	176
Mann-Whitney U	4,020.500
Wilcoxon W	8,833.500
Test Statistic	4,828.500
Standard Error	335.326
Standardized Test Statistic	2.857
Asymptotic Sig. (2-sided test)	.004

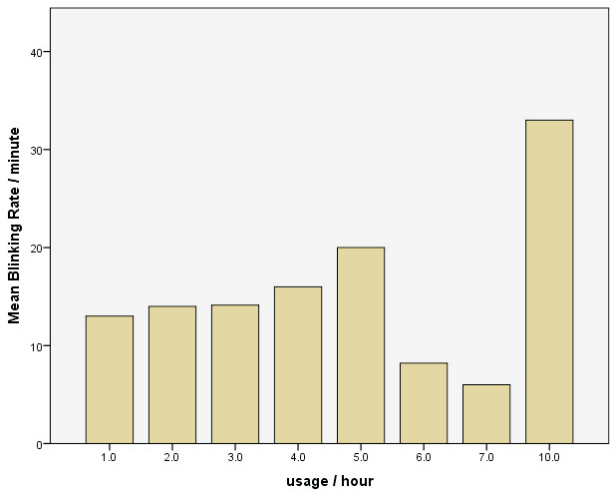
Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Blinking Rate without Glasses	87	2	33	13.28	0.79	7.372
Blinking Rate with Glasses	89	5	24	14.6	0.486	4.587

This table shows that the mean blinking rate is 13.28 ± 7.372 (SE. 0.790) and 14.60 ± 4.587 (SE. 0.486) of without glasses and with glasses respectively. However, the blinking rate without glasses is recorded less as compared to with glasses.



Those who don't wear glasses recorded less blinking rate per minute as compared to those who wear glasses while working on computer.



The blinking rate increased with the usage of computer per year. Those who used computer for 10 or more than 10 hours recorded more blinking rate per minute as compared to those who used computer for only 1 to 5 hours. But there is variation in the graph. In those users who use computer for 6 or 7 hours, there is low blinking rate recorded. It eventually increased in 10 hour users.

CONCLUSION:

The result revealed that the mean blinking rate is 13.28 ± 7.372 (SE. 0.790) and 14.60 ± 4.587 (SE. 0.486) without glasses and with glasses respectively. Mann Whitney-U test showed that there is marked statistically significant difference between blinking rate / minute with glasses and without glasses (p=0.004). However, the blinking rate is decreased with glasses as compared to the without glasses. The blinking rate per minute is increased with the increase in usage of computer per hour. While in those who wear glasses experience large blinking rate.

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