

To study the correlation of visual display terminal (VDT) with dry eye disease (DED) among MBBS students during covid 19 era

Dr. Ritu Jain (MBBS, MS), Dr. Saniya Ahmad Farooqui, Dr. Rahul Verma

Professor¹, 1st year resident^{2,3}

Department of Ophthalmology Rohilkhand Medical College and Hospital

***Corresponding Author:**

Dr. Ritu Jain (MBBS, MS)

Professor in Department of Ophthalmology, Rohilkhand Medical College and Hospital

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ABSTRACT

Introduction

The novel corona virus (COVID 19) which started in NOV 2019 in China has quickly spread over the world, and the number of cases and deaths is continuously growing. We have been taking public health measures where people are confined to their homes. Online classes and work from home have led to massive use of laptop, tablets, cell phone etc. and the prevailing situation have made compulsory usage of facemask.^[1] Although these measures are essential for controlling but they also have a potential impact on the health of ocular surface. These are 2 main mechanisms that could be responsible for the onset or worsening the symptoms of dry eye disease.

Material and methos

A retrospective clinical study was carried out in a tertiary eye care hospital in those student who were taking online classes from their homes in a period from 1st April 2020 to 30th June 2020.

Observation and result

Out of 95 students, 5 students were excluded from study who were corona positive and rest 90 were screened for dry eye disease, 8 showed symptoms of moderate dry eye, 4 had severe dry eye who were given lubricating eye drops for a period of 3-4 months. None had very severe dryness in eyes. Since face mask were used for limited period of time, hence they were not taken into study and were assumed dryness only due to use of visual display terminal.

Conclusion

Individuals exposed to increase screen time for greater than 10 hours had severe to very severe dry eyes and were instructed to blink more often. Also those who wear face mask were instructed to avoid its displacement or incorrect fitting that contributed to air leaking and ocular dryness.

Keywords: Dry eye disease (DED), Visual display terminal (VDT), tears, ocular irritation.

INTRODUCTION

Dry eye occurs when there is inadequate tear volume or function, resulting in an unstable tear film and ocular surface disease. It is an extremely common condition, particularly among students using visual display terminal like laptop and mobiles. The four core interrelated mechanism thought to be

responsible for the manifestation of dry eye are tear instability, tear hyperosmolarity, inflammation and ocular surface damage.

The classification of dry eye usually applied is that of the 2007 International dry eye workshop (DEWS),

with a basic division into aqueous deficient and evaporative types.

Most individuals have considerable overlap between mechanisms and it is important to be aware during patient assessment of the likely presence of multiple contributory factors.

Due to this pandemic, students are at high risk to develop dry eye disease (DED) due to increased visual display which causes decrease blinking interval and gazing which can cause excessive evaporation of tears and ultimately leading to dry eye disease.^[2]

On the other hand, incorrect fitting of face mask could cause air leaking towards the eye. Air dispersing through the mask can cause excessive evaporation of tears. This is same in Continuous positive airway pressure (CPAP) users. The displacement or incorrect use of mask in CPAP can cause dry eyes, ocular irritation and even squamous metaplasia in the conjunctiva.^[3]

It has been shown that ocular symptoms including dry eye is relatively common among COVID-19 patients and can appear before the onset of respiratory symptomatology.^[4,5]

MATERIAL AND METHODS

A retrospective clinical study was carried out in tertiary eye care hospital in those students who were taking online classes from their homes in a period from 1st April 2020 to 30th June 2020.

Grading of dryness was done according to Schirmer test. The test involved amount of wetting of a special (No. 41 Whitman) filter paper, 5mm wide and 35mm long. The filter paper is folded 5mm from one end and inserted at the junction of middle and outer one third of the lower lid taking care not to touch the cornea or the lashes.

The patient is asked to keep the eyes gently closed. After 5 minutes the filter paper is released and the amount of watering from the fold measured.

Less than 10 mm of watering after 5 minutes without anesthesia or less than 6mm with anesthesia is considered abnormal.

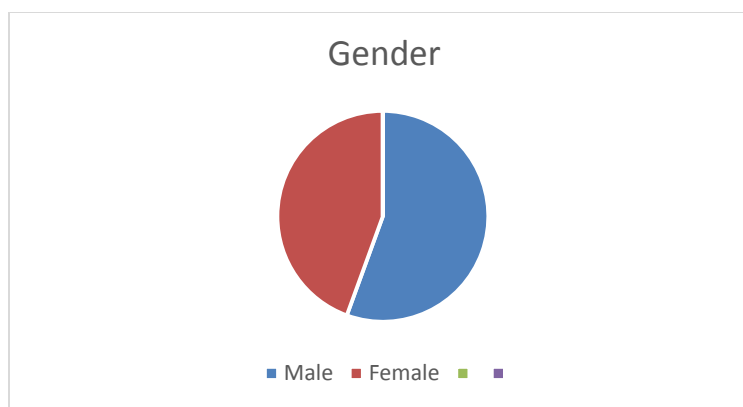
All the MBBS students of 6th semester were included in the study of age group 18-24 years. All those students who had symptoms of COVID-19, contact lens wearer, having vitamin A deficiency or any autoimmune disorder and ocular surface allergy were excluded from our study.

In these study students with complaints of ocular irritation, foreign body sensation and watering, non specific ocular discomfort were subjected to following protocol of examination. Detailed history regarding complaints, onset, and duration were taken into account and students were subjected to detailed slit lamp examination.

Tear film test like Tear film breakup time (BUT), Schirmer I test and Rose Bengal staining were done in all the students complaining of above symptoms and they were graded as mild, moderate, severe and very severe dry eyes recommended by dry eye workshop report.

OBSERVATION AND DISCUSSION: Out of 95 students, 5 students had corona and were excluded from study. 50 (55.55%) were boys and 40(44.44%) were girls. Out of these, 75 students used Visual display terminal (VDT) for greater than 8 hours while 15 wore face mask daily for greater than 2 hours. 8 described appearance or worsening of ocular discomfort symptom and 4 who were confirmed to have dry eyes by routine tests were advised to use lubricating drops and also to decrease screen time.

Table I shows percentage of male and female who were included in the study. (n=90).



AGE	MALE	FEMALE	TOTAL
18-24 years	50(54.44%)	40(44.44%)	90

Table 2 shows the correlation between the use of VDT and number of students

USE OF VDT (HOURS)	NUMBER OF STUDENTS	PERCENTAGE
2-4	45	50
4-6	50	55.55
6-8	82	91.11
>8	75	83.33

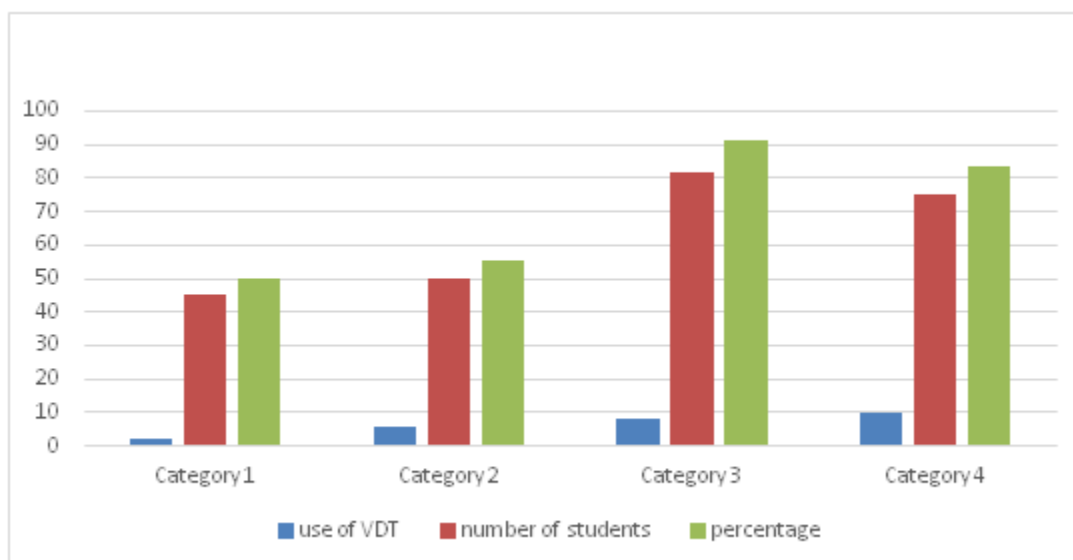
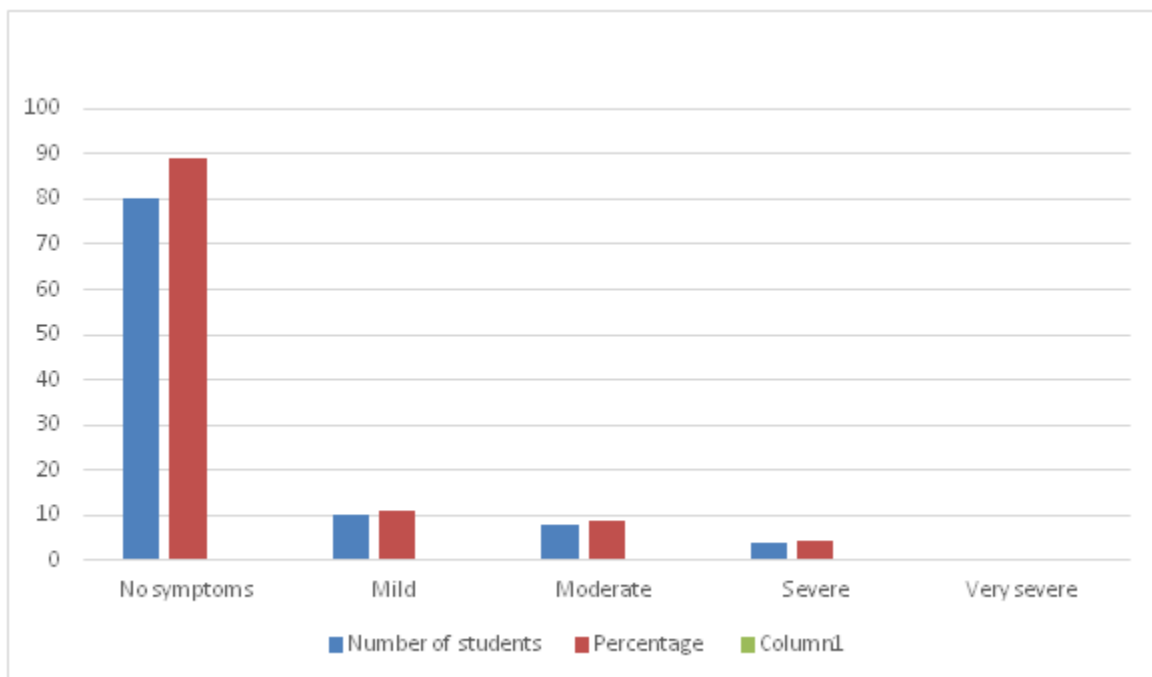


Table 3 shows severity of dry eyes among students

SEVERITY OF DRY EYE DISEASE	NUMBER OF STUDENTS	PERCENTAGE
No symptoms	80	88.88
Mild	10	11.11
Moderate	8	8.88
Severe	4	4.44
Very severe	NIL	0.00



Above table shows the correlation of severity of dryness among the students. According to which most of the students had no symptoms. Those who had severe or moderate dryness complained of watering from eyes and foreign body sensation with eyeache. Only this group was given lubricating eye drop and proper fitting of face mask were instructed.

Table 4: Use of VDT with severity of dryness

USE OF VDT	SEVERITY OF DRYNESS	NUMBER OF STUDENTS
>10	Very severe	None
8 hours	Severe dryness	4
6 hours	Moderate dryness	8
4 hours	Mild	10
2 hours	No symptoms	58

Above table shows correlation of all the three variables where only 4 students had severe dryness of eyes who had used VDT for > 8-10 hours. 60-80 students had mild or no symptoms and had used VDT for 2-4 hours.

DISCUSSION

Table 1 shows that 54.44% were boys and 44.44 % were girls who took part in the study. All students were taking online classes from home.

Table 2 shows number of hour's students had used visual display terminals. It has been seen that 91.11 % of students used laptops, mobiles and tablets and were for greater than 6 hours with these devices. Out of these 11.11% had mild symptoms of dryness in eyes. 8.88% of students had moderate dryness and 4.44 % had severe dryness whom were given lubricating drops and were advised to decrease the on screen time. This is in accordance with the study done by McAlinden *et al*. According to him eleven subjects (10.3%) described appearance or worsening of ocular symptoms and 21 (19.6%) reported the need for daily use of tear substitutes. The mean score of Ocular Surface Disease Index was 21, and 61 subjects (57%) > 15 (pathological values)⁶

Since the pandemic is not yet over a longitudinal examination of DED signs and symptoms in healthy subjects and DED patients is desirable to evaluate the long term impact of these measures on ocular surface. In the meantime, awareness among ophthalmologists of ocular surface disease associated with covid 19 measures should be spread. Furthermore Individuals exposed to increase screen time for greater than 10 hours who had severe to very severe dry eyes and should be instructed to blink more often. Also those who wear face mask should be instructed to avoid its displacement or incorrect fitting that contributed to air leaking and ocular dryness.

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