Original Article

Prevalence Of Symptomatic Dry Eye Disease Among Undergraduate Medical Students After Covid 19 Pandemic In A Tertiary Care Hospital Kanchipuram- A Cr0ss Sectional Study

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Abstract

Background: Dry eye disease (DED) is considered as one of the most prevalent ophthalmological illnesses, caused by a number of systemic and ocular etiologies, including meibomian gland dysfunction (MGD). Medical students are among the high-risk group for developing DED during the COVID-19 pandemic, primarily because visual display terminals (VDTs) are being used more frequently for online courses. During the Covid 19 pandemic curfew there is anincrease in usage of digital devices for mandatory e-learning leads to increased exposure of screen time among medical students.

Objective: The aim of this study to estimate the prevalence of DED among undergraduate medical students.

Methodology:A prospective, Cross Sectional Study was conducted among 250 UG students. After getting informed consent all participants were assessed using the Ocular Surface Disease Index (OSDI) questionnaire, Routine ophthalmological examination along with schrimer test and tear film break-up time (TBUT) as a screening tool for detecting DED.The Data thus collected is entered in Microsoft excel sheet & analyzed using SPSS software version 22.0.Descriptive statistics were applied to summarize the demographic data. Chi-square tests were used for comparisons between categorical variables.

Results: Among the 250 students 104 (41.6%) were males and 146 (58.4%) were females with the Mean age was 21.17 ± 1.2. The prevalence of dry eye disease among study participants was 56.8% (142). On OSDI classification of severity grading 89(41.6%) students had mild DED, 48(13.2%) of students had moderate DED and 5 (21.0%) of students had severe DED.

Conclusion: The study highlighted the drastic increase in use of digital devices after the initiation of the COVID-19 lockdown and there is an increase in prevalence of DED among medical students. Awareness about prevention of digital eye strain should be enforced to bring these adverse effects to a minimum level.

Keywords: Dry eye disease, Digital eye strain, OSDI scoring

Introduction:

Dry eye disease (DED) is a multifactorial disease of the tears & ocular surface that results in symptoms of discomfort, visual disturbance and tears film instability with potential ocular surface damage. According to the American

Optometric Association, as little as two hours of continuous digital device usage per day is enough to bring about the development of an array of eye and vision related problems, and is referred to as "Digital eye strain."[1]

Dry eye symptoms (DES) can severely interfere with daily activities like reading, driving, etc. by causing ocular dryness, discomfort, pain, grittiness, hazy vision, redness, and a foreign-body sensation. Furthermore, bad lighting, glare from digital devices, insufficient viewing distances, and poor sitting can aggravate these symptoms.[2]

Since it is one of the preventable ocular problem early preventable measures is mandatory to reduce the burden of DED. During the COVID-19 pandemic, medical students are among the high-risk group for DED because of increasing screen time with the usage of smart phones and laptops.[3]This includes online conference calls, meetings, and webinars, and online classes, assignments done on digital devices, personal and social video calls, online shopping, leisure, and entertainment.

During Covid-19 pandemic the National Medical Commission also approved the conduct of online classes for medical course.Mandatory online education is responsible for new public health threat called "Digital eye strain"or "Computer vision syndrome".[4]This pandemic also forced the students to stay indoor place which has resulted in an increased use of various electronic devices. Hence this study was conducted to estimate the prevalence of DED among medical students.

Materials and Methods:

Study design: Prospective Cross- sectional study

Study population: Undergraduate medical students

Study location: Meenakshi Medical College Hospital & Research Institute, Kanchipuram.

Inclusion criteria: Medical students who are willing to participate are included.

Exclusion criteria: The exclusion criteria included students with known ocular pathology like glaucoma, strabismus, severe trauma, undergone refractive surgery for vision correction or other ocular or eyelid surgeries that may affect the ocular surface health.

Sampling size: By convenient sampling around 250 medical students were enrolled for this study.

Study period: August 2021 –March 2022.

Data collection method: After getting informed consent the study was conducted by using questionnaire with two sections: demographic data with pre-existing medical conditions and a dry eye questionnaire using the Ocular Surface Disease Index (OSDI). The OSDI questionnaire is comprised of 12 questions assessing 3 main domains of the ocular surface diseases in dry eyes as follows: 5 questions regarding the dry eye symptoms related to chronic dry eye disease; 4 regarding the limited visual performance related to dry eyes; and 3 regarding the severity of the symptoms in specific conditions during the previous week. Overall scores (range from 0 to100) were calculated and categorized into 3 groups: normal (score 0–12); mild symptoms (score 13–22); moderate symptoms (score 23–32); and severe symptoms (score 33–100).

Routine ophthalmological examination along with schrimer test and tear film break-up time (TBUT) as a screening tool for detecting DED.The Data thus collected is entered in Microsoft excel sheet & analyzed using SPSS software version 23.0.Descriptive statistics were applied to summarize the demographic data. Chi-square tests were used for comparisons between categorical variables. A P-value <0.05 was considered as statistically significant.

Results:

Among the 250 students 104 (41.6%) were males and 146 (58.4%) were females.Age ranged from 18 years to 25 years. 170 (68%) were 18-20 years of age, 66(26.4%) were 21-23 years of age, 14 (5.6%) were >23 years of age. Mean age was 21.17 ± 1.2. Table 1 shows socio-demographic details of study participants. There is significant association between gender and DED with significant p value ($p<0.05$). Around 73 (29.2%) were had <=1 hr screen time, 134 (53.6%) were had 1-2 hr screen time and 43 (17.2%) were had >2 hr screen time.

Table 1: Socio-Demographic characteristics of the study group.

FACTORS	**N(250)**	**%**	**P-value**
1.AGE (in yrs)			
18-20	170	68	**0.130**
21-23	66	26.4	
>23	14	5.6	
2.SEX			
Female	146	58.4	**0.001***
Male	104	41.6	
3.SCREEN TIME			
<=1 hr	73	29.2	**0.002***
1-2 hr	134	53.6	
>2 hr	43	17.2	

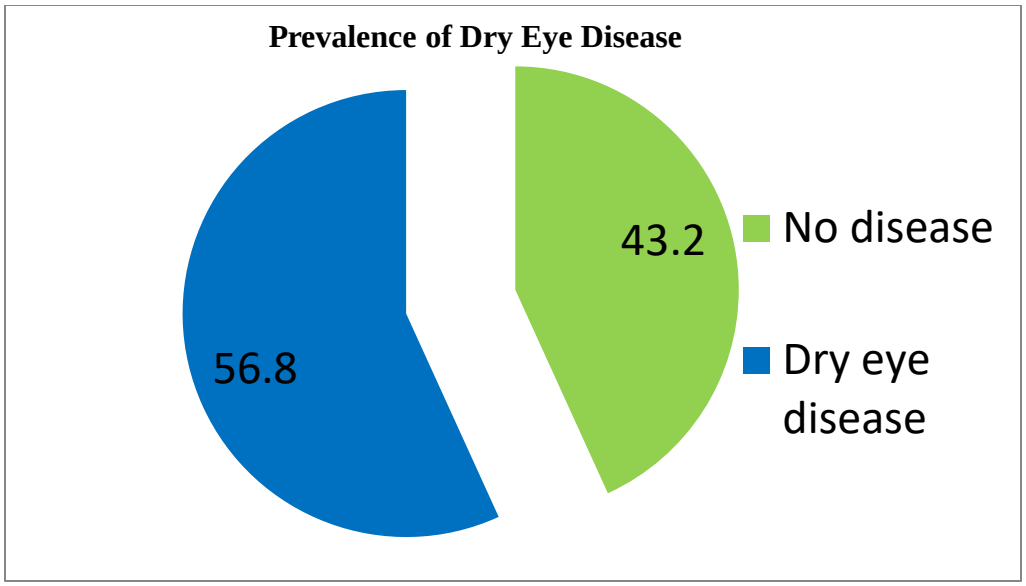

Figure 1: Prevalence of Dry eye disease

Figure 1 show that the prevalence of dry eye disease was calculated as 56.8%. Based on the OSDI scoring the dry eye disease was classified into mild, moderate and severe disease.

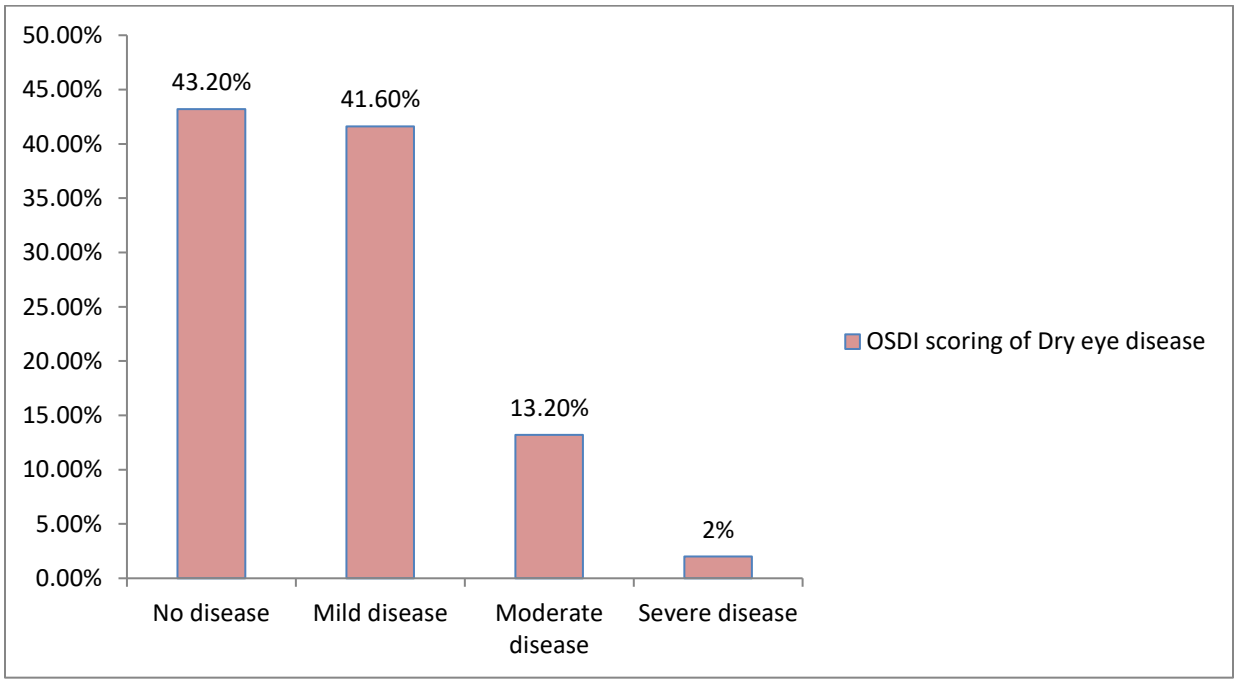

Figure 2: OSDI scoring of dry eye disease

Figure 2 shows distribution of students according to severity of dry eye disease (DED) based on OSDI score. 89(41.6%) students had mild DED, 48(13.2%) of students had moderate DED and 5 (21.0%) of students had severe DED.

TBUT	No.of patients	Percentage

RIGHT EYE		
< 10	114	45.6
≥ 10sec	136	54.4
LEFT EYE		
< 10	108	43.2
≥ 10sec	142	56.8

Table 2: Tear Breakup Time (TBUT) of the study group.

Table 2 shows that analysisoftearbreakuptimewasdoneseparatelyforeacheye. 45.6%and43.2%of the patients had a TBUT of < 10 sec in the right and left eye respectively. 54.4% and56.8%of the patients hada TBUTof≥ 10sec. Themeanvalues for

TBUTinrighteyewere8.68sec±2.51,whereasthemeanvaluesforthelefteyewere8.31sec±2.67.

Discussion:

The current study found that the prevalence of symptomatic DED among medical students was 56.8%. In comparison with other DED epidemiological surveys we also adopted the OSDI questionnaires for grading the disease and found that 41.6% (104)were having mild disease, 13.2 %(33) were having moderate disease and 2% (5)are having severe disease.

This study is similar to a study conducted by Bahkir et al[5] states that the prevalence of DED is 56.5% and the prevalence is more in females.Another study conducted by Lin et al[6] shown that prevalence of DED is 60% and he used OSDI scale to grade the DED with around 40% students having mild disease which is also similar to our study report.Another study of Yang I et al[7]. in medical students stated that DED was diagnosed with OSDI score, keratography, ocular surface staining and the Schirmer test, the prevalence of severe dry eyes (OSDI score >33) was 27.8% compared with 56.8% in our study.

Similar to earlier research by Hyon et al[8] described a strong association between female gender and the development of DED in medical students (P = 0.02) our study also found that female sex was likely to be related with an elevated risk of DED.

A study conducted by Logaraj et al[9] also found that the prevalence of DED is more among medical students about 70% and more exposure to screen time have strong association with DED which is also similar to our study report.According to a study conducted by Iqbal et al[10] showed that as many as 68% of students who used gadgets for > 3hrs per day experienced signs of dryness and acquired the DED which is also similar to our study report.

A study conducted by Patel et al[11] also found that significant relation was found to exist between the increased screen time and the stability of the precorneal tear film.

Conclusion:

After Covid-19 pandemic, there is sudden increase in usage of digital devices, and the overall number of hours of screen time logged per day has been due to a shift of professional and social activities to a web-based platform .Fortunately this condition is reversible with the limited usage of electronic devices with decreased screen time.Proper usage of protective eye devices and Health education is mandatory to prevent the development of disease.

Conflict of interest: None

Funding: Nil

Ethical committee approval: This study got approved by the Institutional ethical committee.

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