

Frequency of Dry Eye Disease among Ophthalmic Patients: A Review Study in a Tertiary Care Hospital in Dhaka, Bangladesh

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Abstract

Background: Dry eye is an emerging health hazard among the individuals exposed to Visual Display Terminals (VDT). About one fourth of the patients who visit ophthalmic clinics or hospitals report symptoms of dry eye, making it a growing public health problem and one of the most common conditions seen by eye care practitioners. We have very few data regarding the frequency and risk factors of dry eye diseases. But that information is very important in treating patients with dry eye diseases.

Aim of the study: The aim of this study was to observe the frequency of dry eye disease (DED) among ophthalmic patients.

Materials and Methods: This was a prospective cross-sectional study conducted at Kurmitola General Hospital, Dhaka, Bangladesh from January 2019 to December 2019. In total 278 patients 18+ years of age attended to the mentioned hospital for ophthalmic treatment were finalized as the study population. The study was approved by the ethical committee of the mentioned hospital. The proper written consents were taken from all the participants before starting the main part of intervention. Data were collected by predesigned questioner and analyzed by SPSS program version 22.0

Results: In analyzing the frequency of DED among 278 participants we found only 22% (n=62) were DED whereas 78% (n=216) were free from DED. We found, the highest frequency of DED patients was in >60 years' age group which was 26.83%. Besides this 24.29%, 21.88%, 19.64% 19.15% in 21-30, 31-40, 41-50 and 51-60 years' age groups respectively. In male group patient's frequency was 28.28% whereas in female group it was 15.79%. In this study in urban residence group the patient's frequency was 24% whereas in rural residence group it was 19.42%. We found 33.87%, 20.97%, 17.74%, 11.29%, 9.68% and 6.45% diseases frequencies in housewives/student, workers with low exposure, indoor office staffs, farmers /laborers, workers with high exposure, and factory worker's groups respectively.

Conclusion: Near about one fifth of the ophthalmic patients suffered from dry eye diseases. Among the ophthalmic patient's possibilities of association of dry eye diseases is higher in aged, male, urban housewives and student.

Key words: Ophthalmology, risk factors, dry eye disease, visual display terminals (VDT).

Introduction

Dry eye is an emerging health hazard among the individuals exposed to Visual Display Terminals (VDT). About one fourth of patients who visit ophthalmic clinics or hospitals report symptoms

of dry eye, making it a growing public health problem and one of the most common conditions seen by eye care practitioners. We have very few data regarding the frequency and risk factors of dry eye diseases. But that information is very

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important in treating patients with dry eye diseases. Dry-eye syndrome is distinct as a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, tear-film instability and visual disturbance with possible damage to the eye.¹ One of the etiology of dry eye is visual Display Terminal (VDT) use. Working on a computer monitor, laptops or digital displays for hours has become a part of the modern work day.² Many such individuals then experience decreased ability to perform certain activities such as reading, driving, and computer related works, which require visual attention affecting their quality of life.³ Nevertheless, their usages for 4 hours per day has led to a health risk of emerging dry eye⁴ many times, symptoms are ignored by an individual and detected only on ophthalmic examination. The definition of dry eye disease has been under continuous revisions in the recent past. The current diagnosis and definition of dry eye disease is based on 3 criteria as given in International Dry Eye Workshop (DEWS) guidelines 2007: 1) decreased tear production or increased tear evaporation, 2) damage to the ocular surface, and 3) associated ocular discomfort or visual disturbance.⁵ Various researchers have labeled dry eye as the most prevalent condition seen in ophthalmology clinics.⁶ Due to tear film instability, dry eye patients report varying degree of stinging, burning, irritation, foreign body sensation, watering, fatigue, redness and photophobia etc. in the affected eye. The symptomatology of dry eye may even be seen in the absence of full triad of features mentioned above that define dry eye disease. Various studies have reported prevalence of dry eyes from 10% to 70% depending on the type of patients/subjects, diagnostic criteria and objective tear film tests used in the study.⁶ Many factors have been reported in literature that are associated with dry eyes that include hot weather, windy air conditions, excessive sun exposure, pollution, smoking, advancing age in females, menopause etc.⁷ Recently, a large prevalence of dry eye disease has been reported in computer users due to decreased blink rate during performance of visual tasks with deep concentration.^{8,9} We conducted a literature on

Google Scholar, PubMed, EMBASE and Cochrane library to find out earlier researches on the subject from Pakistan. Only one study was found in which Jehangir et al had shown presence of dry eye disease with various other ocular pathologies.¹⁰

Objectives

General Objective:

- To collect the information regarding the frequency of dry eye disease among ophthalmic Patients.

Specific Objective:

- To collect information regarding the socio-demographic status of the participants.
- To collect information regarding the symptoms among DED patients.

Methodology & Materials

This was a prospective cross-sectional study which was conducted at Kurmitola General Hospital, Dhaka, Bangladesh during the period from January 2019 to December 2019. In total 278 patients above 18 years attended to the mentioned hospital for ophthalmic treatment were finalized as the study population. The study was approved by the ethical committee of mentioned hospital. The proper written consents were taken from all the participants before starting the main part of intervention. The patients were selected following consecutive purposive sampling. Only those patients were selected who consented to take part in the study. Patients with acute inflammatory conditions, acute infections, gross corneal or conjunctival diseases, contact lens wearers and those who had undergone any form of ocular surgery within the last 6 months were excluded from the study. We recorded detailed ophthalmic and general history of the patients focusing on main causations associated with dry eyes. Smoking, drugs, sun exposure at outdoor and exposure to air pollutants were especially asked about. After detailed history, we run a pre-designed questionnaire about symptoms of dry eye. The questionnaire was administered in

language of the patients and asked for socio-demographic data including age, gender, occupation, residence; and symptoms of dry eyes including recurrent watering, foreign body sensation (grittiness), itching, burning, stinging, dryness, soreness, heaviness etc. A consultant ophthalmologist performed detailed ophthalmic examination of all the patients. During ocular examination, special attention was paid to ocular surface abnormalities, diseases of the eyelids, meibomian gland dysfunction, presence of any strands or filaments etc. Lastly, status of the precorneal tear film was assessed using tear film break-up time (TBUT). The test was performed at room temperature, keeping fans turned off after application of fluorescein dye in the inferior fornix. The patient was asked to blink 4-5 times to allow distribution of fluorescein dye over the ocular surface. Finally, the patient was asked not to blink any further and was examined on slit lamp bio-microscope with cobalt blue filter. After time interval between last blink and appearance of first area of discontinuation in the precorneal tear film was TBUT. Patients exhibiting this interval to be less than ten seconds were labelled to be suffering from dry eyes. If any patient stated usage of ocular lubricants, his TBUT was measured after discontinuation of that medicine for at least 24 hours. SPSS version 22.0 was used to do data analyses using 95% confidence intervals (CI). The likelihood ratio was used to calculate the p-values using Pearson Chi-square tests with a p-value of less than 0.05 considered as statistically significant. Associations of environmental risk factors with dry eye were assessed using regression analysis.

Results

In this study the highest number of patients were found from 18-30 years' age group which was 25.28% among the total participants. Besides this, 23.02%, 20.14%, 16.91% and 14.75% patients were participated from 31-40, 41-50, 51-60 and >60 years' age groups respectively. In analyzing the gender of the participants we found, among total 278 study population male were 145(52.16%) and the rest 133(47.84%) were female. Among all the participants 175(62.95%)

were from urban areas and 103(37.05%) were from rural areas. In analyzing the occupation of the participants we found, the highest number of participants were housewife or students which was 33.09% (n=92). Besides this, 21.22%, 17.99%, 11.87%, 8.99% and 6.83% were from farmer/laborer, worker with high exposure, indoor office staff, worker with low exposure and factory worker respectively. In this study in analyzing the frequencies of dry diseases we found, the highest frequency of dry eye diseases (DED) patients was in >60 years' age group which was 26.83%. Besides this 24.29%, 21.88%, 19.64% 19.15% in 21-30, 31-40, 41-50 and 51-60 years' age groups respectively. In male group patients' frequency was 28.28% whereas in female group it was 15.79%. In this study in urban residence group the patients' frequency was 24% whereas in rural residence group it was 19.42%. We found 11.29%, 9.68%, 17.74%, 20.97% and 6.45% diseases frequencies in farmers /laborers, workers with high exposure, indoor office staffs, workers with low exposure, housewives/students and factory worker's groups respectively. In analyzing the frequency of dry eye disease (DED) among total 278 participants we found only 22% (n=62) were DED whereas 78% (n=216) were free from DED.

Table I: Socio-demographic characteristics of participants (N=278)

Characteristics	n	%
Age Groups (Years)		
18 – 30	70	25.18
31 – 40	64	23.02
41 – 50	56	20.14
51 – 60	47	16.91
>60	41	14.75
Gender		
Male	145	52.16
Female	133	47.84
Residence		
Urban	175	62.95
Rural	103	37.05
Occupation		
Student	64	23.02
Indoor office staff	56	20.14
Housewife	51	18.35
Laborer	48	17.27
Factory worker	34	12.23
Farmer	25	8.99

Table II: Frequencies of dry eyes diseases according to the characteristics (N=278)

Component	Participants n	DED n	(%)	p value
Age Groups (years)				
21 – 30	70	17	24.29	0.058
31 – 40	64	14	21.88	
41 – 50	56	11	19.64	
51 – 60	47	9	19.15	
>60	41	11	26.83	
Gender				
Male	145	41	28.28	
Female	133	21	15.79	
Living Areas				
Urban	175	42	24.00	
Rural	103	20	19.42	
Occupation				
Student	64	21	33.09	0.376
Indoor office staff	56	13	21.22	
Housewife	51	11	17.99	
Laborer	48	7	11.87	
Factory worker	34	6	9.68	
Farmer	25	4	6.45	

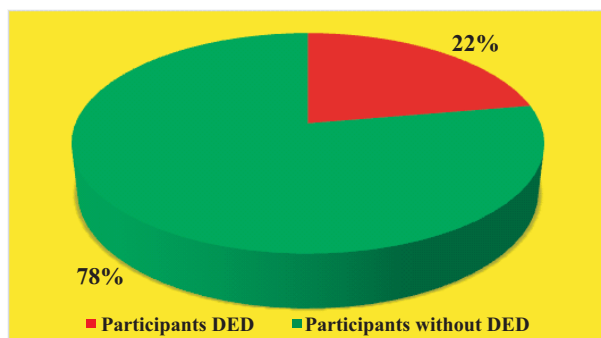


Figure I : Ratio of DED patients among total participants (n=278)

Table III: Distribution of symptoms among DED patients (n=62)

Symptoms	n	%
Blurred Vision	30	48.39
Watering	23	37.10
Itching	13	20.97
Heaviness	11	17.74
Burning	10	16.13
Stickiness	8	12.90
Dryness	7	11.29
Grittiness	5	8.06
Excessive Mucoïd discharge	2	3.23

Discussion

The aim of this study was to observe the frequency of dry eye disease (DED) among ophthalmic patients. Various studies have shown prevalence of dry eyes to vary from around 10% to 70% depending on the diagnostic criteria used and cut-off values for various tear film assessment tests.¹¹ Some studies performed tests only on those patients who had significant number of positive complaints about dry eyes resulting in higher prevalence of dry eyes.¹² Besides, some studies were carried out solely on patients with rheumatoid arthritis or Sjogren’s syndrome who reported a high prevalence of dry eyes.¹³ We found 22% frequency of DED among total ophthalmic patients. Our results showed that the prevalence of dry eye increased as the age of the patients increased showing a direct relationship between age and dry eyes. This result was also consistent with many other studies.¹⁴ A relative peak of dry eye prevalence was found in the age group 31-40 years as had earlier been observed by Hikichi et al.¹⁵ These findings were very dissimilar with our findings. We found greater association of DED in aged respondents. Countries like Pakistan with plenty of sun exposure can exhibit this phenomenon to a greater extent. However, we recommend more studies in this regard to find exact cause of this spike of prevalence of dry eyes in age group 31-40 years. In our study, we found higher number of association of DED in male respondent. But in many previous studies it was dissimilar. The higher prevalence of dry eyes in females implies that females seek medical attention earlier than males for their dry eye symptoms. Besides, menopause causes decreased estrogen level in females that lead to decreased tear film production in them.¹⁶ But post-menopausal period is very potential period for considering the association of DED. Though our patients showed a higher prevalence of dry eyes in post-menopausal women, earlier studies have shown same prevalence of dry eyes in both pre- and post-menopausal women.¹⁴ People residing in urban areas showed higher prevalence of dry eyes as compared to rural residents. In various other studies, the difference was statistically significant.

The higher prevalence in rural residents is thought to be the result of excessive exposure to sunlight and high outdoor temperatures.¹⁷ People belonging to various occupations like farmers/laborers, housewives; people with meibomian gland dysfunction, diabetics, and people with excessive exposure to sunlight, wind, cigarette smoking and air pollution were significantly related to dry eye. Khurana et al reported high prevalence of dry eyes in farmers and laborers (32% and 28% respectively) most likely due to increased exposure to hot temperatures and sunlight.^{18,19} This necessitates urgent need to create awareness among farmers and laborers to take safety measures during their work. Many earlier studies have shown smoking, diabetes and pollution to be risk factors for dry eyes.²⁰ The major limitation of our study was exclusion of patients with various corneal and conjunctival pathologies which led to a relative apparent underestimation of prevalence of dry eyes in our sample. Besides these, participants using contact lenses were also excluded who could have been a potential source of the condition.

Conclusion and Recommendations

Near about one fifth of the ophthalmic patients suffered from dry eye diseases. Among the ophthalmic patient's possibilities of association of DED is higher in aged, male, urban housewives and/or students. This was a single centered study with a small sized sample. So the findings of this study may not reflect the exact scenario of the whole country. For getting more specific findings we would like to recommend for conducting more studies regarding the same issue with larger sized sample.

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