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ORIGINAL RESEARCH ARTICLE

PRACTICE REGARDING DRY EYE SYNDROME AMONG GENERAL POPULATION IN CENTRAL REGION OF NEPAL

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ABSTRACT

Background: Dry eye disease is a common disorder of the tear film due to decreased tear production, excessive tear evaporation, or abnormality in mucin or lipid components of the tear film associated with symptoms of ocular discomfort. Dry eye disease is a chronic, multifactorial disease, which is also called keratoconjunctivitis sicca. The aim of this study is to know about the practice concerning Dry Eye Disease and analyze the associated risk factors in Central Region of Nepal.

Methods: This was a cross-section hospital-based, observational study conducted in Chitwan Medical College and Teaching Hospital from 17 September 2021 to 16 December 2021.Cases enrolled over 3 months were administered in ocular surface disease. Proforma was designed and filled to evaluate the practice and risk factors of DED. SPSS version 26 was used to analyze the data entered in a specified proforma.

Results: During the pandemic period 300 patient participated in the study. Among the patient rolled in the study 217 (72.33%) had<10sec of TBUT and 83(27.67%) had> 10sec TBUT. 47(15.67%), normal Schirmer's test, 148(49.33%) had mild and 78(26%) moderate, 27(9%) had severe dry eye. Most of the patient presented with dryness 119(39.8%), Foreign body sensation 97(32.3%), itching 52(17.3%) and Redness 22(7.3%).

Conclusions: Our results show most of the patients have mild to severe dry eye. Most of the patient presented with dryness, foreign body sensation, itching and Redness. VDG (TV and laptop) contact time of more than 2 hours were associated with increased odds of developing DED.

INTRODUCTION

Dry eye disease is a common disorder of the tear film that results from decreased tear production, excessive tear evaporation, or abnormality in mucin or lipid components of the tear film associated with symptoms of ocular discomfort.[1]Dry eye disease (DED) is a chronic, multifactorial disease, which is also called keratoconjunctivitis sicca (KCS) [2] Patients experience dry eyes symptoms constantly and severely, affecting their quality of life.[3]

Several studies have shown the relationship of dry eye disease and the tear film, autoimmune mechanisms and skin diseases[4]. There are various risk factors for dry eye which include contact lens wear, eyelid and lacrimal gland damage, age and others air pollution, smoking, low humidity, high temperature, sunlight exposure and drugs.[5,6]The main symptom of dry eyes is dryness and foreign body sensation, along with burning, itching, blurred vision and photophobia which were more worsen in dry weathers, low humidity and higher temperatures.[7,8]The prevalence of dry eyes varies from 10.8% to 57.1%. It is a common eyes disorder among the population, more affecting those older than 50-year-old.[9] The most commonly affected are the middle-age and older adults due to the high prevalence of refractive surgeries, systemic drug effects, autoimmune diseases and contact lens usage in these group.[10]Research have shown that DES is more common in women than in men.[11] In menopause women an imbalance occurs between the estrogen and androgen hormones. This excites inflammation in lacrimal gland and ocular surface, disrupting the normal homeostatic maintenance of the lacrimal gland and ocular surface.[12]

DED, though a common problem in this pandemic situation the patients require high level of attention to provide comfort to the patient. The primary objective of the study was to analyze the practice of DED and associated risk factors.

METHODS

This study was cross-sectional hospital-based, descriptive study conducted at Chitwan Medical College. Patients presenting to the outdoor patient department over a period of 3 months (17 September 2021– 16 December 2021) were evaluated. Ethical clearance was obtained from the Institutional Review committee

of Chitwan Medical College (CMC-IRC/078/079-040). Informed consent was obtained, and the study adhered to the tenets of the Declaration of Helsinki.

Convenience sampling was performed to enroll patients, wherein the first patient attended our department and willing to give consent was randomly, and subsequently, enrolled in the study. Verbal and written consent was obtained before filling the specially designed Performa.

Sample size was calculated by using the formula, Sample size = $Z^2p\ (1-p)/d^2$. In a study done by Joshi SL (Kathmandu Univ Med J) the prevalence of dry eyes in an urban population was found to be 25%.

Where

Z^2 1-α/2 (Is standard normal variate) = 1.96 at 5 % level of significance,

P (Expected proportion in population taken from previous studies) = 25%

d (precision) = 5%

Sample size= $1.96^2 \times 0.25\ (1-0.25)/0.05^2 = 0.72/0.0025 = 288$

Comprehensive history was obtained from all the patients with emphasis on history pertaining to dry eye. In addition, history of visual display Gadgets (VDG) usage including television, smartphones, tablets, laptops, etc., was also elicited and analyzed. Tear break up time and Schirmer's test was done. Tear break up time is done by applying fluorescein strip on ocular surface and seen under the slit lamp biomicroscopy with a cobalt blue light. Value of <10 sec was considered as indicative of tear film instability.[13]Similarly Schirmer's test was done by using and seen its extent of wetting after 5 min. Whatman's filter paper no 41 (measuring 5 mm × 35 mm) was placed in the lower fornix at the lateral one-third of the lower lid margin. The extent of wetting of the strip was measured after 5 min. less than 5 mm of wetting was diagnostic of severe dry eye, if more than 5-10mm was considered as moderate dry eye, 10-15mm was considered as mild dry eye and more than 15mm was considered as normal.[14]

Data was collected using a specialized proforma for the study, and entered in Statistical Package for the Social Sciences (SPSS) version 26 and analyzed.

RESULTS

This study included 300 participants aged between 9 to 90 years with most patients of 33(25-45%) being the most common age. Most of the patients were female 203(67.67%). Majority of patient were Hindu 285(95%). Majority of patient were from urban area 251(83.67%). Most of the patients were 34(11.33%) smokers. Among the 300 patients 30(10%) are regular alcoholic and 11(3.67%) are those who take alcohol occasional alcohol. 33(11%) have used contact lens and 134(44.67%) uses VDG between 2-4 hours.

Table 1: Patients' baseline demographic characteristics (n=300)

Parameters	Characteristics	Frequency (%)
Age		33 (25-45) *
Sex	Male	97 (32.33)
	Female	203 (67.67)
Religion	Hindu	285 (95)
	Non-Hindu	15 (5)
Habitat	Urban	251 (83.67)
	Rural	49(16.33)
Smoking	Smokers	34 (11.33)
	Non-smokers	266 (88.67)
Alcoholic	No	258 (86)
	Regular	30 (10)
	Occasional	11 (3.67)
	heavy alcoholic	1 (0.33)
Contact lens used	Yes	33 (11)
	No	267 (89)
Screen time(VDG)	less than 2hrs	108 (36)
	2hrs to 4 hrs	134 (44.67)
	more than 4hrs	58 (19.33)
Occupation	Homemakers	124 (41.33)
	Students	70 (23.33)
	Bankers	13 (4.33)
	Shopkeepers	22 (7.33)
	Teachers	18 (6)
	Drivers	10 (3.33)
	Others	43 (14.33)

**Median (inter-quartile range)*

Table 2 showed that among the patient rolled in the study 217 (72.33%) have <10sec of TBUT and 83(27.67%) have > 10sec TBUT. 47(15.67%), have normal Schirmer's test, 148(49.33%) have mild and 78(26%) moderate, 27(9%) have severe dry eye. 148(49.33%) have best corrected visual acuity.

Table 2: Functional and anatomical tests (n=300)

Parameters	Characteristics	Frequency (%)
Tear break-up time		
	< 10 sec.	217 (72.33)
	> 10 sec	83 (27.67)
Schirmer's test		
	Normal (>15)mm	47 (15.67)
	Mild (10-15)mm	148 (49.33)
	Moderate (6- 10)mm	78 (26)
	Severe (<6)mm	27 (9)
Visual Acuity		
	Normal	145 (48.33)
	Best Corrected	148 (49.33)
	Impaired	7 (2.33)
Anterior segment		
	Normal	284 (94.67)
	Abnormal	16 (5.33)
Posterior segment		
	Normal	288 (96)
	Abnormal	12 (4)
Pupillary Reaction		
	Normal	300 (100)
	RAPD	0
	APD	0

Table 3: Frequency (%) distribution of dry eye disorder across drugs used (n=300)

Drugs	Schirmer's test				
	Normal	Mild	Moderate	Severe	Total
Anti-psychiatric	1 (12.5)	5 (62.5)	1 (12.5)	1 (12.5)	8 (100)
contraceptive	1 (25)	2 (50)	1 (25)	0	4 (100)
Anti-HTN	5 (13.16)	23 (60.53)	6 (15.79)	4 (10.53)	38 (100)
OHA	5 (12.82)	27 (69.23)	4 (10.26)	3 (7.69)	39 (100)
Insulin	0	6 (75)	1 (12.5)	1 (12.5)	8 (100)
Anti-allergic	0	2 (100)	0	0	2 (100)
Artificial tears	2 (8.7)	7 (30.43)	8 (34.78)	6 (26.09)	23 (100)
Oral steroids	1 (12.5)	2 (25)	5 (62.5)	0	8 (100)
None	15 (18.29)	33 (40.24)	31 (37.8)	3 (3.66)	82 (100)
others	17 (19.32)	41 (46.59)	21 (23.86)	9 (10.23)	88 (100)
Total	47 (15.67)	148 (49.33)	78 (26)	27 (9)	300 (100)

Table 3 showed the effects of Dry eye with the used of different drugs.

Table 4 showed that the most of the patient presented with dryness 119(39.8%), foreign body sensation 97(32.3%), itching 52(17.3%) and Redness 22(7.3%). The discharge from the eye was observed in 3 (1%) patient.

Table 5 showed that 77(52.02%) patients using the VDG (TV, Mobile, Laptop) for 2-4 hours have mild type of DED.

Table 4: Frequency of signs and symptoms

Signs/ Symptoms	Frequency (%)
Dryness	119(39.7)
Foreign body sensation	97(32.3)
Corneal Filaments	6(2%)
Redness	22(7.3)
Itching	52(17.3)
Discharge	3(1)

Table 5: Results of Schirmer's test

Schirmer's test	< 2 hrs	2-4 hrs	> 4 hrs	Total
Normal (>15) mm	26(55.3%)	13(27.65%)	8(17.02%)	47
Mild (10-15) mm	51(34.4%)	77(52.02%)	20(13.51%)	148
Moderate (6-10)mm	25(32.05%)	33(42.30%)	20(25.64%)	78
Severe (<6) mm	6(22.2%)	11(40.78%)	10(37.03%)	27
Total	108	134	58	300

DISCUSSION

Dry eye is the major tear film disorder that affects the millions of people worldwide. Dry eye can be present with mild sign like hyperemia of conjunctiva with no vision affected on the other hand it can be presented with irreversible signs like corneal opacity and ulceration which can be lead to sight threatening corneal complications. [15]

Our results show most of the patients have mild to severe dry eye. Most of the patient presented with dryness 119(39.8%), Foreign body sensation 97(32.3%), itching 52(17.3%) and Redness 22(7.3%), which is similar to the study done by Reem Mohammed Kalakattawi at el. DED the most commonly affected age group are the middle-age and older adults due to the high prevalence of systemic drug effects, autoimmune diseases, contact lens usage and another factor in these group. [10] Which is similar in our study too. Research also shows that DED can affect any race and is more common in women than in men, which is more similar with the study.[11]In female hormonal imbalance excites inflammation in lacrimal gland and ocular surface, disrupting the normal homeostatic maintenance of the lacrimal gland and ocular surface.[12] Housewives and students have the high prevalence of DED and the outdoors workers farmers have the low prevalence of dry eye, which is similar to the other studies.[16] Most of the patients using mobile, laptop for prolong time (>2hours) have more prone to have the DED than using <2 hours which is similar to the different studies.[15] Our study also shows 34(%) are smokers. Smoking and air pollution have been suggested as risk factors in various studies. Smoking predisposes the eye to tear film instability by its direct irritant action on the eye and represent modifiable risk factors in dry eye causation.[17]

On the other hand, our result did not show any relation between gender, age, air pollution, ocular surgery. This maybe because in our sample most of the patients were female so we could not compare between male and female in this disease. While most studies reported a relation between gender and age and the prevalence of dry eye syndrome, researches argued that women suffering from dry eye more than men and also people with highest ages[18, 19]. Though our study didn't show statically significant correlation between the dry eye with smokers and use of different ocular and systemic drugs but there is significant co-relation of symptoms of dry eye in others study. In addition, the symptoms of this disease increase with use of electronic devices, air pollution which is not done in this study[4-6].

In the current study dry eye disease is the commonest ocular problem. With the detail history and simple test we were able to find the cause and diagnose the disease. The findings of this study may not be generalized to other parts of Nepal and abroad due to the short study period and a smaller sample size. However; this study can be taken as a pilot study to conduct larger sample size study in different settings.

CONCLUSION

In conclusion Dry Eye affects most of the people. . Most of the patient with dry eye presented with dryness, foreign body sensation, itching and Redness. Visual acuity assessment, proper history taking, detail slit lamp examination of conjunctiva and cornea, with the simple test like tear break up time and Schirmer's tests we can clinically grade different severity of dry eye disease.

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CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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