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Original Research

Prevalence and associated factors of dry eye

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ABSTRACT:

Background: To study prevalence and associated factors of dry eye. **Materials & methods:** A total of 250 subjects were enrolled. The age of subjects was 40 years and above. The data was collected. Multivariable logistic regression analysis was done. The results were analysed using SPSS software. The p- value less than 0.05 was considered significant. **Results:** The prevalence of dry eye was found to be maximum in the elderly.Farmers and those doing outdoor jobs have the highest prevalence of dry eye, which is 57.6% while those doing indoor jobs without the use of air conditioners have the least prevalence of dry eye. **Conclusion:** Dry eye is a very common condition with a high prevalence among the elderly.

Keywords: Dry eye, tear film, age.

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INTRODUCTION

Dry eye represents a multifactorial, heterogeneous disorder of the preocular tear film, which results in ocular surface disease. The tear film and ocular surface form a complex and stable system that can lose its equilibrium through numerous disturbing factors. [1]Reduction in quality of life is inevitable when symptoms of dry eye occur. These symptoms range from mild transient irritation to persistent dryness, burning, itchiness, redness, pain, ocular fatigue and visual disturbance. In the United States alone, approximately 7–10 million Americans require artificial tear preparations, with consumers spending over $100 million/year.[2]

Dry eye disease is defined as a "multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and subacute inflammation of the ocular surface". [3]The ocular surface (cornea, conjunctiva, accessory lacrimal glands), meibomian glands (specific sebaceous glands of the eyelid margin, which produce the outer lipid film of the tear film), the main lacrimal gland, and the innervation between them form a functional unit. Any or all of these structures may be affected in dry eye disease.[4] Recent studies have shown that dry eye is an inflammatory disease that has many features in common with autoimmune disease.[4,5] Stress to the ocular surface (environmental factors, infection, endogenous stress, antigens, genetic factors) is postulated as the pathogenetic triggering mechanism. Proinflammatory cytokines, chemokines, and matrix metalloproteinases lead to the expansion of autoreactive T helper cells which infiltrate the ocular surface and lacrimal gland.[4,5] The result is a vicious circle of damage to the ocular surface and inflammation.A more recent area of study in dry eye is the implications for visual function and its quality. [6]The decreased blink rate experienced during visual function tasks (for example extended computer use, reading, watching TV, working on microscope) can exacerbate dry eye and its signs and symptoms (like blurred vision, ocular surface staining, short tear film break-up time [TBUT]), which in turn, can limit patients' visual functioning capabilities.[7] Hence, this study was conducted to study prevalence and associated factors of dry eye.

MATERIALS & METHODS

A total of 250 subjects were enrolled. The age of subjects was 40 years and above. Patients were consecutively selected and underwent a routine ophthalmological examination along with tear film break-up time (TBUT) as a screening tool for

detecting the presence of dry eye. Laboratory investigations were done. The data was collected. Multivariable logistic regression analysis was done. The results were analysed using SPSS software. The p- value less than 0.05 was considered significant.

RESULTS

A total of 250 subjects were enrolled. The overall prevalence of dry eye was found to be 52.5%. The prevalence of dry eye was found to be maximum in the elderly.Farmers and those doing outdoor jobs have the highest prevalence of dry eye, which is 57.6% while those doing indoor jobs without the use of air conditioners have the least prevalence of dry eye. A multivariable logistic regression analysis showed an association between dry eye prevalence and outdoor workers, participants working indoor using air conditioner, housewives and diabetics.

Table 1: demographic and clinical profile

Variable	Number of subjects	Percentage
Age (years)		
40-50	100	40
51-60	100	40
61-70	50	20
Systemic diseases		
Diabetes	50	20
Hypertension	84	33.6

Table 2: Prevalence of dry eye among various groups

Groups	Prevalence of dry eye
Farmers	57.6
Housewife	54
Indoor workers with air conditioner	55.2
Indoor workers without air conditioner	40
Total	52.5

Table 3: multivariable logistic regression analysis

Variable	P– value
Groups	
Farmers	0.02
Housewife	0.02
Diabetes	0.001

DISCUSSION

Dry eye impairs functional vision, especially in reading, at the computer, or when driving.[8-10] Reading speed is significantly reduced and correlates with disease severity.[8] Tests in a driving simulator have shown significantly reduced reaction time.[9] Reduced quality of life in everyday activities and leisure pursuits is reported by 60% of patients—comparable to the decrease in quality of life reported for angina pectoris—while 38% of patients complain of reduced efficiency at work. [11,12]Hence, this study was conducted to study prevalence and associated factors of dry eye.

In the present study, a total of 250 subjects were enrolled. The overall prevalence of dry eye was found to be 52.5%. The prevalence of dry eye was found to be maximum in the elderly.Farmers and those doing outdoor jobs have the highest prevalence of dry eye, which is 57.6% while those doing indoor jobs without the use of air conditioners have the least prevalence of dry eye. A study by Shah S et al, The mean age of the study population was 58.6 years. The overall prevalence of dry eye was found to be 54.3%. An association was found between dry eye prevalence and outdoor workers, participants working indoor using air conditioners, housewives, diabetics, patients who have undergone previous ocular surgery and those with meibomian gland dysfunction. Dry eye is a very common condition with a high prevalence among the elderly. They recommend the screening of all out-patients by TBUT, which is a simple test to perform and examination of lids for meibomian gland disease, which if present can be treated. Further studies are needed to establish uniform diagnostic criteria for dry eye, which will help to get more concrete prevalence data, as well as its etiological factors.[13]

In the present study, a multivariable logistic regression analysis showed an association between dry eye prevalence and outdoor workers, participants working indoor using air conditioner, housewives and diabetics. Another study by Lee A J et al, prevalence of one or more of the six dry eye symptoms often or all the time adjusted for age was 27.5% (95% confidence interval (CI) 24.8 to 30.2). After adjusting for all significant variables, independent risk factors for dry eye were pterygium ($p<0.001$, multivariate odds ratio (OR) 1.8; 95% CI 1.4 to 2.5) and a history of current cigarette smoking ($p=0.05$, multivariate OR 1.5; 95% CI 1.0 to 2.2). This population based study provides prevalence rates of dry eye symptoms in a

tropical developing nation. [14]Increased age and dry eye has been demonstrated previously [15] although Schein et al[16] found no age correlation to exist. Although dry eye is thought to be more prevalent in women compared with men.[17,18]Deficient tear secretion from oestrogen deficiency in menopausal women has been hypothesised to explain sex differences, although studies have found that women on hormone replacement therapy may have an increased risk of dry eye.[18,19]Dry eye symptoms in our population were around 1.5 times more prevalent in current cigarette smokers than non-smokers, with borderline significance after multivariate adjustment. The Beaver Dam Eye Study,[5] which first reported cigarette smoking as a risk factor for dry eye, found a 1.4 times increase in dry eye in current cigarette smokers. They proposed that cigarette smoke acts as a direct irritant in the eyes, and represents a modifiable risk factor for dry eye.[15]Dry eye is a chronic disease but acute exacerbations are frequent when performing activities such as driving, viewing a video display for long periods of time and shopping in stores with high flow AC. Dry eye patients live and work in controlled drafty and/or low humidity (desiccating stress) environmental conditions, and the irritation and ocular surface disease [20-22] they experience from this environment may decrease their productivity and quality of life. [23,24] Exposure to desiccating environmental conditions has been shown to activate stress-sensing cells/pathways on the ocular surface, to stimulate ocular surface epithelial cells to synthesize and secrete of pro-inflammatory cytokines and MMPs that can be detected in the epithelial cells themselves. [25]

CONCLUSION

Dry eye is a very common condition with a high prevalence among the elderly.

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