Prevalence of Dry Eye Disease in Western India

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ABSTRACT

Introduction: Dry eye disease (DED), as defined by the dry eye work shop (DEWS II) guidelines, is a multifactorial disease with various etiologies ranging from instability and hyperosmolarity of the tear film, inflammation and damage of the ocular surface and neurosensory abnormalities. Study was done with the purpose to report the prevalence of dry eye disease (DED) in western India.

Material and Methods: This was a cross sectional study conducted from April 2018 to March 2019. Patients from outpatient department > 18 years of age were selected based on systematic random sampling. The ocular surface disease index (OSDI) questionnaire was explained to the patients and asked to fill-up and the total OSDI score was calculated. Based on the OSDI scoring, DED prevalence was calculated. Demographic details of the patients were noted and compared between all patients and those with DED.

Results: Of the 578 patients included in the study, 198 patients (34.26%) had DED. Of those, 95 (47.98%) patients had mild DED, 63 (31.82%) had moderate DED and 40 (20.20%) had severe DED. The mean age of patients with DED was 50.63±18.69 years. Females (54.04%) were more commonly affected compared to males (45.96%). There was significant difference in mean age among the total patients and DED patients (P= 0.03). The gender ratio was not significantly different among total patients and DED patients (P=0.17).

Conclusion: The hospital-based prevalence of DED in western India is 34.26%. The disease is more common in elderly females.

Keywords: Dry Eye Disease, Prevalence, Ocular Surface Disease Index Scoring

INTRODUCTION

Dry eye disease (DED) causes symptoms of visual impairment and ocular discomfort like burning and grittiness.[1] Based on the severity, the symptoms can be disabling and the disease affects a person's quality of life and productivity at work.[2] Ocular surface disease index (OSDI) is a validated questionnaire that quantifies patient's symptoms.[3] Clinical evaluation includes tests for tear production, tear-film stability and ocular surface damage assessment.[4]

The risk factors for DED include elderly age, female gender, extreme weather conditions, use of air conditioners, digital screen usage and systemic diseases like diabetes, arthritis and autoimmune diseases.[5-7] The prevalence of DED varies from 5%-35% depending on the geographical location, climate and lifestyle of the people.[8-10] Studies from India have reported a higher prevalence of DED.[11-16] We conducted this study to report the DED prevalence at an eye hospital in western India.

MATERIAL AND METHODS

This was a cross-sectional study conducted at a private eye hospital in Ahmedabad from April 2018 to March 2019. Patients aged >18 years who presented at the outpatient department during this period were selected based on systematic random sampling. The first patient was selected randomly and then eyery third patient was selected. Patients were given the OSDI questionnaire and explained about how to fill that. Verbal informed consent was taken from the patients. Those not willing to give the consent were excluded from the study.

Demographic details of all the included subjects were recorded. Detail history and basic ophthalmologic examination was done for all the patients. Then depending on the patient's complaint and reason for presenting to the hospital, further evaluation was done.

The OSDI is a validated questionnaire that consists of 12 questions. There are 5 questions related to ocular symptoms, 4 related to visual functions and 3 related to environmental triggers. The responses range from 0-4, where 0 stands for none of the time and 4 stands for all the time. The final score is calculated as:

$$\text{OSDI score} = \frac{(\text{Sum of all responses}) \times 25}{\text{Number of questions answered}}$$

The total score ranges from 0-100. Depending on the final OSDI score, DED is graded as none (0-12), mild (13-22), moderate (23-32) and severe (≥33). The OSDI scores for all the included subjects were calculated and based on that, patients with DED were grouped into mild, moderate and severe.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS software (version 20.0, SPSS. Inc.). The prevalence of DED was calculated and expressed at 95% confidence interval (CI). Continuous data was expressed as mean ± sd form. Quantitative data was analyzed using student's t-test and qualitative data was analyzed using chi-square test. P value of <0.05 was considered significant.

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DED	Number of patients	Percentage (%)	Age in years	Males	Females
Mild	95	47.98	44.14±19.85	47 (49.47%)	48 (50.53%)
Moderate	63	31.82	49.60±21.17	28 (44.44%)	35 (55.56%)
Severe	40	20.20	63.25±6.95	16 (40%)	24 (60%)
Total	198	-	50.63±18.69	91 (45.96%)	107 (54.04%)

Table-1: Demographic details and grading of patients with DED

RESULTS

A total of 578 patients were included in the study. Of those, there were 298 (51.56%) males and 280 (48.44%) females. The mean age of all the included subjects was 47.3 ± 18.61 years.

198 patients had DED based on OSDI scoring. So the prevalence of DED in our study was 34.26% (30.4%-38.3% at 95% CI). Of those, 95 (47.98%) patients had mild DED, 63 (31.82%) had moderate DED and 40 (20.20%) had severe DED. Table 1 shows the demographic details of patients with DED. The mean age of patients with DED was 50.63 ± 18.69 years. Females (54.04%) were more commonly affected compared to males (45.96%).

There was significant difference in mean age among the total patients and DED patients (P= 0.03). The gender ratio was not significantly different among total patients and DED patients (P=0.17).

DISCUSSION

DED is a major socio-economic problem. With the widespread use of digital devices (computers, tablets, laptops, smartphones, television), the disease which was previously more common in elderly is affecting the younger age groups as well.[16] The disease affects the productivity at work.[2] We conducted this study to find out the prevalence of DED.

Studies have shown prevalence of DED ranging from 5% to 35%.[8-10] The prevalence varies with the geographical location, environmental conditions and the lifestyle of people. So places with extreme temperatures and dry weather conditions report a higher prevalence of DED. People's lifestyle like sitting in air conditioned rooms, use of digital devices and smoking also increase the likelihood of DED.[5-7] Studies from India have reported a higher prevalence ranging from 18.4% to 54.3%.[11-16] In our study, we found a prevalence of 34.26%. As discussed earlier, the tropical weather conditions probably account for the higher prevalence in our country.

Most of the patients (47.98%) had mild DED, followed by moderate and severe disease. Previous Indian study has reported moderate DED to be most common.[16] Our results could have been because of the small sample size. Also, this may be because of the fact that the patients were randomly selected and were not specific patients with complaints of dry eyes.

The mean age of patients with DED was 50.63±18.69 years and it was significantly more than the total included patients. DED, as already proved in previous studies, is more common with increasing age.[5-7] This is because the lipid layer of the tear film, which prevents tear evaporation, gradually becomes thinner and less efficient with age. So this affects the stability of the tear film and leads to DED.[17] Aging is also associated with meibomian gland dysfunction in the elderly, which again leads to poor lipid layer and tear film instability.[18] We found DED to be more common in females. This is supported by previous studies and explained by the fact that the lipid layer changes seen in elderly more commonly affects the females compared to males.[5-7,17]

The limitation of our study is the small sample size. Further study with a larger sample size and with other objective assessments of DED can be done in future.

CONCLUSION

The hospital-based prevalence of DED in western India is 34.26%. The disease is more common in elderly females.

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