TO QUANTIFY SEVERITY OF DRY EYE DISEASE IN AN ADULT POPULATION
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ABSTRACT

BACKGROUND
Dry eye is a very common disorder of tear film resulting from either decreased tear production or increased tear evaporation. Although it is not a common cause of vision loss, but as the disease progresses, it can lead to sight threatening complications. It can be caused by the deficiency of any one or more of the tear film components or can be a component of systemic diseases such as Sjogren’s syndrome, Lupus and Stevens-Johnson syndrome. We wanted to study the severity of dry eye disease in an adult population.

METHODS
A study was conducted in the Department of Ophthalmology, Peoples College of Medical Sciences, Bhopal (M. P). Duration of the study was 6 months. Total 250 patients attending eye OPD were examined. A detailed history of patients including demographic details, usage of electronic device, and history of systemic disease was noted.

RESULTS
Mean age of patients was 38.1±17.1 years and 61.6% were females. According to Schirmer’s and TBUT interpretation 14.6% and 7.6% patients respectively had severe dry eye. Mean OSDI was 14.8±8.4. Pearson’s and Spearman rho correlation coefficient were found to be significant between ages and various tests of dry eye (p<0.05).

CONCLUSIONS
The proportion of dry eye in our study was found to be higher in females as compared to males. The correlation between tests of dry eye and age was found to be significant.

KEYWORDS
Dry Eye, Schirmer’s Test, Tear Break Up Time Test, Ocular Surface Disease Index


BACKGROUND
The National Eye Institute / industry workshop of clinical trials in dry eye by Michael. A. Lemp defined dry eye as a disorder of tear film due to tear deficiency or excessive tear evaporation that causes damage to the interpalpebral ocular surface and is associated with symptoms of ocular discomfort.1,2,3

According to DEWS, Dry eye is a disease of multiple factors that involve tears and ocular surface leading to symptoms of discomfort, visual disturbance, and tear film instability with damage to the ocular surface. It is associated with increased osmolarity of the tear film and inflammation of the ocular surface.4 It can further be categorized as episodic or chronic. Episodic dry eye occurs when environmental or visual tasks with reduced blinking affect the stability of the same environmental conditions, persisting with symptoms and possible damage to the ocular surface.

The term ‘dry eye’ was coined by Swedish Ophthalmologist Henrik Sjogren, who described the triad of dry eye, dry mouth, and joint pains in the year 1933.5 Due to instability and incapability of tear film in patient with dry eye disease, thereby affecting the protective qualities of tear film that are necessary for its structure and function. Thus, patients experiencing the symptoms associated with dry eye, like; burning, stinging, grittiness, foreign body sensation, tearing, ocular fatigue, and dryness.6 The prevalence of Dry eye disease is estimated to be 7.4% to 33.7%.7
Dry eye disease (DED) is one of the most commonly encountered ocular morbidities. Twenty-five percent of patients visiting eye care center with dry eye symptoms, augmenting it as major public health problem and one of the most common conditions seen by ophthalmologists. With increasing number of patients of dry eye disease, lifestyle and environmental modification along with development of newer diagnostic instruments, and the recent knowledge has updated. However, a better understanding of presenting symptoms, external and systemic factors contributing to dry eye and the ideal tests for it will help in early diagnosis of this chronic condition, with more efficient and effective treatment and long-term patient satisfaction.

There are many factors that can cause dry eye such as:
1. Contact Lens Wearers, as it desensitizes the cornea over years of contact lens stimulation.
2. Adverse environmental exposures such as Dry and Windy conditions.
3. People sitting under Air Conditioners and Ceiling Fans for a longer time.
4. Frequent Flying: Air in the Airplane cabin is extremely dry and can lead to dry eye disease.
5. Systemic diseases like Type 2 Diabetes Mellitus, Hypertension, Hypothyroidism can contribute to dry eye problems.
6. Lasik and other Refractive Surgeries like PRK can also lead to Dry eye disease due to severing of corneal nerves during surgery.
7. Certain Medications such as Anti-Histaminic, Anti-Depressants and Birth Control Pills can exaggerate the symptoms of dry eye.
8. Extended visual tasking during computer/laptop/smart phone use, television watching, and prolonged reading provoke symptoms of dry eye.
9. It can also be influenced through various daily activities and social and dietary habits such as smoking, which increases the frequency of dry eye.

METHODS
A Cross-sectional study was conducted in the Department of Ophthalmology, People’s College of Medical Sciences and Research Centre and associated People’s Hospital, Bhanpur, Bhopal (M.P.) during the time period from November 2017 to April 2018. A written informed consent was obtained from each patient before including them for study. Ethical institutional clearance was obtained for the study. Patients presenting to eye OPD were included in the study and undergone routine eye examination.

Inclusion Criteria
1. All the patients above 18 years of age attending eye OPD with proper informed consent.
2. Patients willing to participate in study.

Exclusion Criteria
1. Patients not willing to participate.
2. Patients under the age of 18.
3. Any other ocular pathology.
4. Any major intraoperative complications.
5. Patients on long term ocular topical medication.
6. Contact lens wearers.

A detailed history of patients including their name, age, gender, address, occupation, history of systemic diseases such as Diabetes, Rheumatoid Arthritis, Hypertension, Hypothyroidism was noted. Attributable risk factors that exaggerate the symptoms of dry eye such as place of residence, excessive wind, sunlight, high temperature, air pollution, drug abuse, computer/laptop/smart phone user, exposure to frequent flights, myopia and hypermetropia was asked. A detailed history of medication was also asked.

Occupation is categorized into 4 categories as follows:
1) Professional workers - Doctors, teachers, Chartered Accountants, Computer operators, clerks etc.
2) Field workers- Farmers, laborers, industrial and factory workers etc.,
3) Students
4) Unemployed- Old age persons, retired persons, housewives etc.

After recording relevant history and taking informed consent, all patients underwent complete eye examination as follows:
- Vision
- Refraction
- Slit Lamp Examination
- Tear Break Up Time Test
- Schirmer’s Test
- Ocular Surface Disease Index (OSDI).

In our study 250 patients were examined after taking written informed consent.

Firstly, the patients underwent for visual acuity testing by Snellen’s chart, refraction and the best corrected visual acuity was recorded. A complete slit lamp examination of the lid margins, tear meniscus, conjunctiva, cornea and tear film were done to rule out any anterior segment pathology. Relevant examination of other important ocular structures was done and their OSDI was noted. Following this, tests to diagnose dry eye were performed. These are Schirmer’s test and Tear break up time test.

Patients were categorized according to grades:-

Schirmer’s test:—
- Mild- 11-15 mm
- Moderate- 5-10 mm
- Severe- <5 mm

TBUT:—
- Mild- 11-15 sec.
- Marginal- 5-10 sec.
- Severe- <5 sec.

OSDI:—
- Normal- 0-12
- Mild- 13-22
- Moderate- 23-32
- Severe- 33-100
RESULTS
Mean age of patients in our study was 38.1±17.11 years. Majority of patients belonged to 21 to 30 years (33.6%) followed by 31 to 40 years (18%). Only 3.2% patients were >70 years of age. Also, majority of participants were female 154(61.6%), whereas only 96 (38.4%) were males. And mostly from urban areas i.e. 195 (78%) and remaining 55 (22%) were from rural area. Majority of individuals were Professional workers (47.6%) followed by Unemployed (28.8%), Students (12.4%) and field workers (11.2%).

According to Schirmer test interpretation, 122 (48.8%) patient had bilateral mild dry eye 93 (37.2%) patients were having bilateral moderate dry eye and 35 (14%) patients had bilateral severe dry eye. (Figure 1)

According to interpretation of tear breakup time test, 134 (53.6%) patients having bilateral mild dry eye 97 (38.8%) patients were having TBUT in marginal range for both eye and 19 (7.6%) had TBUT in severe range for both eyes. (Figure 2)

Mean OSDI was found to be 14.82±8.4. OSDI for majority of patients i.e. 129 (51.6%) was found to be in the range of 0-12 followed by 80 (32%) patients 13-22 range, 33 (13.2%) in 23-32 range and 8 (3.2%) patient within range of 33-100. (Figure 3)

Also, majority of patients in our study were having Hypertension (16%), this was an incidental finding. This was followed by Diabetes and Hypothyroidism.

DISCUSSION
Dry eye syndrome is a very common public health problem encountered by ophthalmologists. In our study, mean age of patients was 38.1±17.11 years. The mean age of patients in a study by Kamalakshy J et al.9 was 51.6 years and maximum numbers of cases belonged to 50-59 age group and in study by Baisoya P et al.10 mean age of the patients was 47.80±16.37 years. In our study majority were female patient similar to study done by Kamalakshy J et al9 where female patients were more than number of male patients. According to Schirmer test interpretation in our study, 48.8% patients had bilateral mild dry eye, 37.2% patients had bilateral moderate dry eye and 14% patients had bilateral severe dry eye. Whereas in a study by Baisoya P et al.10 mild, moderate and severe dry eye was seen in 57.87%, 39.14% and 1.27% patients respectively. Tear breakup time shows 53.6% patient under mild range, 38.8% patients was in marginal range for both eye and 7.6% patients in severe range. Whereas in study conducted by Baisoya P et al.10 mild, moderate and severe dry eye was seen in 57.87%, 39.14% and 1.27% patients respectively. In our study, 16% patients had associated history of hypertension. These findings were similar to study by Kamalakshy J et al.9. In our study, we also observed the inverse relation of OSDI with Schirmer’s and TBUT.

The main limitation of our study is that the sample size of our study is small, and the duration of the study is shorter, thus it cannot define the problem among the generalized population.
CONCLUSIONS
The prevalence of dry eye increased with increase in age and was significantly higher among people more than 40 years of age. Prevalence was higher among females when compared to males. Prevalence was higher among people living in urban localities as compared to rural. OSDI was found to be reliable measure of dry eye symptoms. It was higher among patients who were prone to excessive usage of electronic devices such as computer/laptop/smart phones/televisions etc. Higher the scores of OSDI, higher is the severity of dry eye and there is a significant correlation between OSDI and dry eye disease. Schirmer test showed a high sensitivity and specificity. We also observed that there is an inverse relation between OSDI with Schirmer’s and TBUT. By evaluating clinical symptoms and various tear parameters, a reliable diagnosis of dry eye can be made. Various contributing factors for dry eye are age, female gender, outdoor jobs, electronic device use, diabetes mellitus and rheumatoid arthritis. Computer/ laptop/ smart phone use is emerging as a risk factor for dry eye. Age of the patient is an important consideration as dry eye is more common in elderly. Early and appropriate management will provide ocular comfort and satisfaction with a better quality of life.

REFERENCES