

Study to Assess Dry Eye among Patients of a Tertiary Care Hospital in Jharkhand

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ABSTRACT

Introduction: Dry eye, commonly presented as ocular discomfort, burning sensation and foreign body sensation is a frequently encountered complaint among the patients attending ophthalmology OPD. Prevalence of this entity is still not known in our study population due to lack of specificity of symptoms and diagnostic criteria.

Material and Methods: A prospective, observational, cross-sectional study was conducted among patients attending ophthalmology OPD in a tertiary care teaching hospital of Jharkhand. One thousand and twenty nine patients with dry eye symptoms were examined after taking informed consent.

Results: Four hundred and five (39.3%) patients were found to have dry eye based on McMonnies questionnaire, Schirmer's test and tear film breakup time. There were 295 female and 110 male with dry eye. Male to female ratio was 2.7:1.

Conclusion: Prevalence of dry eye was more in females and elderly as compared to male and younger population respectively. Burning sensation and ocular discomfort was the most common presenting complaint.

Keywords: Dry eye, McMonnies Questionnaire, Schirmer's test, Tear Film Break-up Time.

disease conditions also can lead to dry eyes like symptoms.³ Early diagnosis is the key in preventing patients from vision-threatening complications of dry eye disease. Symptom assessment with screening and diagnostic tests are used to establish the diagnosis of dry eye. McMonnies questionnaire is a well-balanced and focused screening test for dry eye.⁴ It is a subjective test with sensitivity of 87-98% and specificity 87-97%.⁴ This questionnaire consists of 12 questions related to the risk factors for DED. These include demographic information, dry eye symptoms, previous and current dry eye treatments, secondary symptoms (associated with environmental stimuli), systemic conditions (Sjögren syndrome, arthritis, thyroid disease), and dryness of the mucous membranes (chest, throat, mouth or vagina).⁵ Due to subjective nature of self-reported symptoms, test is reliable and repeatable than objective clinical tests in detecting dry eye. A study done by Nichols KK showed that objective test such as Schirmer's test adds to the final diagnosis of dry eye disease.⁶ Tear film breakup time (TBUT) is a clinical test used to assess evaporative dry eye disease. To measure TBUT, tear film is stained with sodium fluorescein 1% and patient is asked not to blink while the tear film is observed under a broad beam of cobalt blue illumination in slit lamp. Time is noted for the first appearance of a "dark" dry spot which is recorded as the TBUT.⁷ Thus, this study used McMonnies questionnaire for screening and Schirmer's test and TBUT for diagnosis of dry eye disease to evaluate the proportion of dry eye cases among patients of a tertiary care hospital in Ranchi.

MATERIAL AND METHODS

This was a cross-sectional study conducted in the Department of Ophthalmology of Rajendra Institute of Medical Sciences (RIMS), Ranchi Jharkhand. The study was conducted during July 2016 to June 2017 after taking approval from the Institutional Ethics Committee, RIMS, Ranchi. Study was done in accordance with the principles expressed in the Declaration of Helsinki. 1029 patients attending the eye OPD were selected for the study meeting the inclusion criteria.

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INTRODUCTION

Burning sensation and ocular irritation is the common presenting complaint in patient attending ophthalmology OPD during summer. The condition is diagnosed as dry eye, a disorder of tear films. Keratoconjunctivitis sicca (KCS) is a multifactorial disease caused by decreased tear production or excessive tear evaporation, leading to the symptoms of dry eyes.¹

Normal tear film consists of three layers: superficial lipid layer produced by the meibomian glands, middle aqueous layer produced by the lacrimal gland and accessory lacrimal glands of Wolfring and Krause and innermost mucin layer produced by the goblet cells. Each layer have their own specific functions. Lipid layer prevents evaporation of tear films, middle layer constitutes 90% of tear film and inner layer lowers the surface tension and renders the corneal surface wet.²

There are two main categories of dry eye conditions. *Aqueous tear-deficient dry eye* (ATDDE), caused by deficiency of lacrimal gland in producing tears e.g. Sjogren's syndrome (SS) *Evaporative dry eye* (EDE) caused by excessive evaporation of tears e.g. dry eye due to meibomian gland dysfunction, ocular surface disorders, low blink rate, computer vision syndrome etc. In diabetes mellitus, lacrimal gland dysfunction, decreased corneal sensitivity and loss of goblet cells leads to dry eye syndrome. Various drugs and

Informed consent form written in English and vernacular languages were obtained from each participant. Collection and analysis of the data were anonymous; In addition, the clinical tests did not cause any physical harm to patients. We believed nothing was against health, safety and privacy of patients in this study.

Inclusion criteria: Patients attending ophthalmology OPD with age at presentation above 18 years with presenting complain consistent with dry eyes⁹ (ocular discomfort, burning sensation, redness, itching, dryness etc) were included in this study.

Exclusion criteria: Patients taking any ocular or systemic medications, or had undergone intra or extra ocular surgery or with an active ocular infection in the previous 6 months were excluded from the study also patient not giving consent or had not agreement with the study were excluded.

Procedures for assessing the dry eye

Subjects were asked to fill McMonnies questionnaire which had 14 questions that focused on the clinical risk factors for dry eye. These were related to age, gender, dry eye symptoms (foreign body sensation, burning, itching etc) feeling of dryness and tiredness, previous treatment for dry eye, secondary symptoms (associated with environmental stimuli), systemic diseases, dryness of mucous membranes, and systemic medications.¹⁰

Scoring of the dry eye

The scores ranged from 0 to 45. Individuals having McMonnies score greater than 14.5 were evaluated for Dry Eye diagnosis.¹¹

Schirmer's test

A sterilized Schirmer's strip (5 X 35 mm Whatman filter paper no. 41) was placed over the junction of medial two-third and lateral one-third of lower lid after instilling a drop of (0.5%) Proparacaine. The test was considered positive when the the level of strip wetting (in millimeters) after five minutes was less than ten millimeters. Positive Schirmer's test represents aqueous tear deficiency.¹⁰

Procedure of tear film break-up time

A sterilized 2% fluorescein strip was moistened with lubricating eye drop and placed in the lateral one-third of lower lid in a non-anaesthetised eye and patient was asked to blink only once or twice to avoid pooling of fluorescein, following which the strip was removed. Tear film was observed on Cobalt blue light of the slit lamp and time was noted. Time lapse between the last blink and the appearance of the first randomly distributed dark discontinuity in the fluorescein-stained tear film is the tear break up time. Values of less than 10 seconds were considered abnormal.¹⁰

Diagnosis of dry eye

It was done with positive Schirmer's test (wetting <10 mm) and TBUT of <10 s along with McMonnies score more than 14.5.¹¹ Data were noted on a standardized pro forma.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the analysis. Descriptive

statistics like mean and percentages were used for the analysis.

RESULTS

Total 1029 patients were administered the McMonnies Questionnaire after meeting the inclusion and exclusion criteria. 405 (39.3%) subjects had score above 14.5 and screened to have dry eyes and further evaluated by Schirmer test and TBUT (Figure 1). 295 (72.83%) were female and 110(27.1%) were male (Figure 2). Female to male ratio was 2.7: 1. Patients were distributed from 18 to 73 years with majority above 42 years. Mean age of the study population was 49.1 years. Figure 3 represents age distribution of the patients with dry eyes. In the entire three age groups dry eye was more common in female than male. In male most common age group affected was 18-40 years while female above 61 years were affected most commonly. Table 1 represents the common symptoms reported by the patients. Most common symptom reported was burning sensation, ocular discomfort and foreign body sensation.

DISCUSSION

Dry eye is one of the commonly encountered ocular

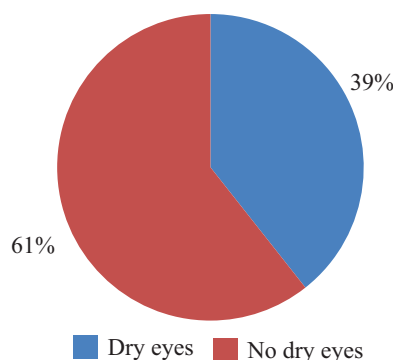


Figure-1: Proportion of dry eyes cases

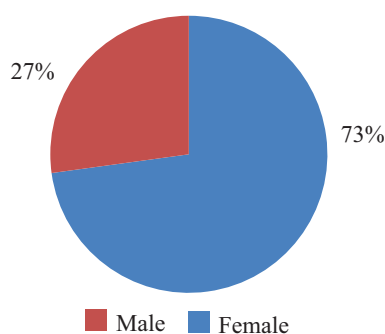


Figure-2: Sex distribution

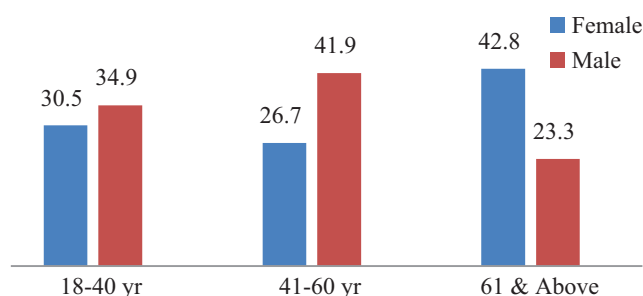


Figure-3: Age distribution of patients with dry eyes

- Burning sensation
- Ocular discomfort
- Foreign body sensation
- Watering
- Dryness
- Grittiness
- Itching
- Scratchiness
- Redness
- Ocular pain
- Photophobia

Table-1: Common symptoms reported by patients with dry eye

morbidities seen by ophthalmologists in general practice. It is common in this part of India especially during summers when the climate is dry and hot. The disease is ignored commonly because of nonspecific symptoms and so the exact prevalence of this condition is not estimated precisely. The diagnostic accuracy of various subjective and objective methods varies a lot. The proportion of dry eye patients diagnosed in our study is 39.3% which is lower than the study done at West Bengal¹² where it was around 54% and higher than the study conducted by Bhutia et al¹³ in Sikkim where it was around 12.7%. Thus the proportion of dry eyes varies in different geographical locality.

In our study, relatively higher numbers of female are affected in all age groups as compared to male with overall female: male ratio 2.7:1. This was very similar to other studies where females were affected more than male.¹⁴ Various literatures support this finding. A study from United Kingdom suggests that evaporation of tear film is significantly higher in elderly and females because of the thinner and less efficient lipid layer in the tear films which is required to prevent the evaporation of tear films.¹⁵ These findings are in concordance with the previous studies by Shaumburg et al, Moss *et al* emphasizing higher prevalence of dry eye in women and elderly.^{16,17}

Dry eye cases are also common in occupationally exposed population and subjects using modern gadgets like computer and mobile. This may be due to reduced blinking rate while working on monitor for longer duration.¹⁸ This is also reflected in our study where 42 years and above population were affected more commonly while mean age was 49.1 years. In our study, number of dry eye cases in male were more in 18-60 years age group while in females this was more in above 61 years age group. This may be attributed to the outdoor activity of males and effect of post menopausal hormonal changes in female in the particular age group respectively.¹⁹ These associations were also seen and explained in the study by Sahai et al in hospital based population from Jaipur in western part of India.²⁰

The most common complaints of dry eye patients are burning, heaviness, stickiness, foreign body sensation, redness, itching, blurred vision, and light sensitivity. In our study, the common complaints were burning sensation, ocular discomfort, foreign body sensation, dryness and grittiness. Similar symptoms were also reported in study by Shah et al²¹ and Bhutia et al.¹³

The procedures used for the diagnosis were safe and no side

effects were seen in any of the participant while performing Schirmers test and TBUT. Result from questionnaire and the tests correlated well in this study.

Limitations of the study

Sample size and duration of study was small in the study thus the study does not necessary represent the result for entire population.

CONCLUSION

Though dry eye is a frequently encountered entity for general practitioners and ophthalmologists, but still it is under-diagnosed due to lack of specificity of symptoms. Lack of definitive diagnostic tests and time consuming questioners methods making it more complicated and confusing. Most of the cases are due to occupation related and normal aging process. Proper counseling of the patients regarding the chronic nature disease with long term treatment and preventive measures are necessary to relieve ocular discomfort and ensure patient satisfaction with a better quality of life.

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