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Original Research Article

Demographic profile and risk factors associated with dry eye disease in North Western Rajasthan, India

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ABSTRACT

Background: The aim was to study the demographic profile and analyze risk factor associated with dry eye disease in North West Rajasthan, India.
Methods: This was a hospital-based study conducted in Department of Ophthalmology, Sardar Patel Medical College, Bikaner, Rajasthan. Sample size of this study was 100 patients. All participants underwent a general ophthalmic assessment including history of any previous ocular and systemic illness along with ocular examination on slit lamp and specific tests for dry eye (Schirmer's test and Tear film break up time) were performed.
Results: Dry eye were seen maximum in age group 46 to 60 years (41%), followed by 61-75 years (23%). Female's preponderance was seen compared with male. Dry eye patients belong from rural areas were (57%) while remaining (43%) from urban areas and among these highest were farmer/labourers (32%). Several known risk factors were found in this study which include post-menopause. Climatic condition like excessive wind, high temperature and computers users had strong association with dry eye. In Systemic disease rheumatoid arthritis was commonly associated with dry eye were. Smoking contact lens use were also associated with increased risk of developing dry eye.
Conclusions: Dry eye disease are more common in older age group patients. Female's preponderance were found in the study especially postmeopausal women. Dry eye disease are more common in patients belongs to rural areas. Risk factor associated with dry eye were Climatic condition like excessive wind, high temperature and computers users, systemic disease like rheumatoid arthritis Smoking, contact lens users.

Keywords: Dry eye, Schirmer's test, Tear film break up time, Risk factors

INTRODUCTION

Dry eye is an important public health problem causing ocular discomfort, fatigue and visual disturbance that may interfere with daily activities. Dry eye is a disorder of the tear film which occurs due to tear deficiency or excessive tear evaporation.[1]

In 2007, International Dry Eye Workshop (DEWS)[2] gave a new definition of dry eye: "Dry eye is a multifactorial disease of tear film and ocular surface resulting in symptoms of ocular discomfort, visual disturbance and tear film instability with potential damage to the ocular surface." This is associated with hyperosmolarity of the tear film and inflammation of ocular surface. Patients with dry eye often complain of pain, heaviness, foreign body sensation, redness, photophobia and reflex watering due to corneal irritation.

Literatures have recognized various risk factors for the development of dry eye. These include female gender, hormonal changes, systemic autoimmune disease (most

prominently Sjogren syndrome), decreased corneal sensation, refractive surgery, blinking abnormalities, drug effects, viral infections such as HIV, diabetes mellitus, Vitamin A deficiency found as a risk factor for dry eye.[3]

The purpose of this study was to identify the demographic profile and risk factors associated with dry eye in North West Rajasthan, India.

METHODS

This was a hospital-based study on population attending outpatient Department of Ophthalmology, Sardar Patel Medical College, Bikaner, Rajasthan. Permission from institutional review board had taken. Sample size of this study was 100 patients. Patients of age 15 years and above were included in the study. All participants underwent a general ophthalmic assessment including history of any previous ocular and systemic illness along with ocular examination on slit lamp and specific test for dry eye (Schirmer's test and Tear film break up time) were performed. A questionnaire Ocular Surface Disease Index for each patient presenting with symptoms suggestive of dry eye were filled and recorded. The exclusion criteria for the study were acute ocular infections, foreign body, extensive ocular surface pathologies and previous ocular surgery.

Inclusion criteria

Diagnostic criteria for dry eye required these patients to one of the following test positive

- Schirmer's test I measuring less than 10 mm
- Tear film break up time measuring less than 10 seconds.

RESULTS

Among 100 patients studied, the age of the patients ranged from 15 to 75 years. Most of the patients who presented with dry eye were in age group 46 to 60 years (41%), followed by 61 to 75 years (23%) (Figure 1).

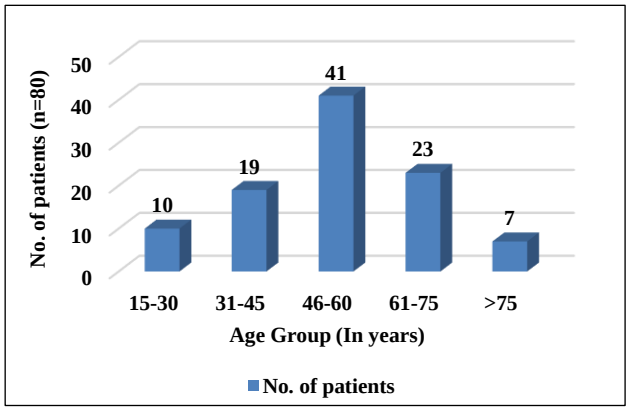

Figure 1: Distribution of total study population according to age.

Gender wise distribution showed a preponderance of females as compared with males. Out of these hundred patients 58% were females and 42% were males (Figure 2).

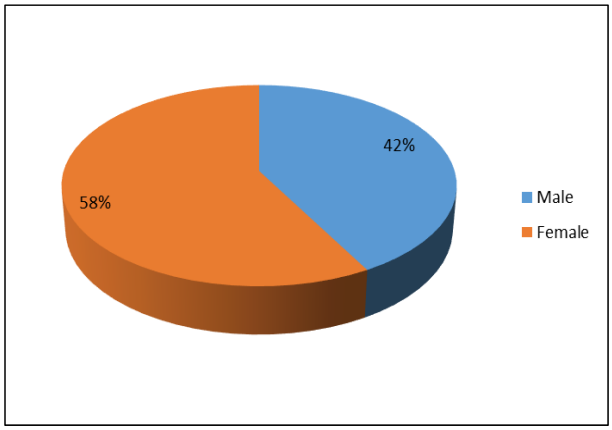

Figure 2: Gender wise total study population (N=80).

Among females dry eye was more common in postmenopausal women (Figure 3).

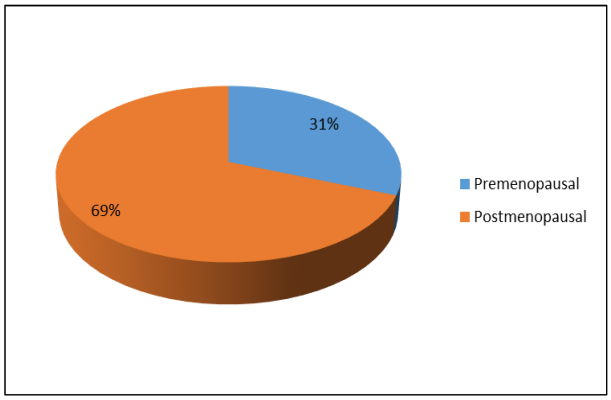

Figure 3: Distribution of menopausal state.

In this study dry eye patients belong from rural areas were (57%) while remaining (43%) from urban areas (Figure 4).

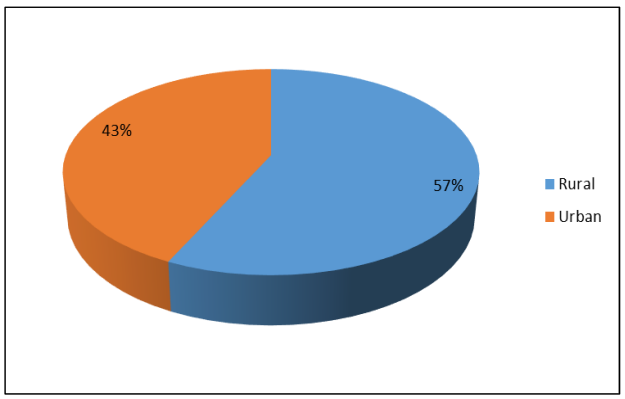

Figure 4: Residence wise total study population.

Occupation wise farmers/labourers were most affected with dry eye (32%) followed by office workers like bankers, administrative officers (26%), housewives (22%), student (9%), other (11%) (Figure 5).

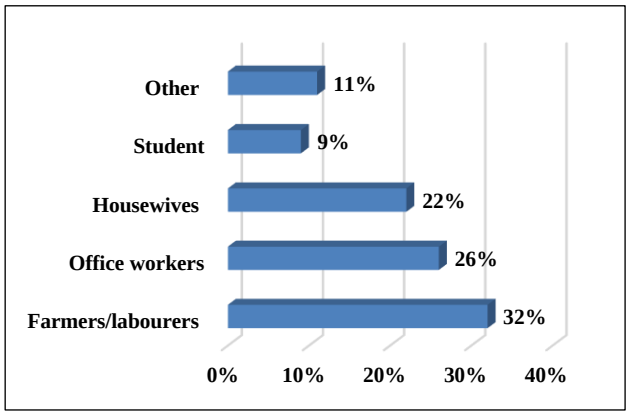

Figure 5: Distribution of study population according to occupation.

We found in this study that (28%) patients were exposed to excessive wind and high temperature were at higher risk of developing dry eye. Dry eye was commonly seen in excessive computer and smartphone users (18%). Exposure to air conditioner was seen in (9%) of patients. We observed in this study that (6%) patients were on antiglaucoma medication. Only (4%) patients were soft contact lens users and all of them had dry eye. About (7%) smokers had dry eye (Table 1).

Table 1: Risk factors in total study population

Risk factors	No of patients (%)
High temperature/Excessive wind	28
Computer /smartphone users	18
Air conditioner	9
Antiglaucoma medication	6
Contact lens users	4
Smokers	7
Rheumatoid arthritis	11
Diabetes mellitus	6
Hypertension	3

In our study, systemic disease associated with dry eye were studied. Rheumatoid arthritis was seen in (11%), diabetes mellitus in (6%), hypertension in (3%) patients (Table 1).

DISCUSSION

In this study, largest number of patients were in group of 45 to 60 years of age, which was 41% percent. Guillon et al[4] have shown in a study in United Kingdom that the tear film evaporation is significantly higher in subjects above the age of 45 years. According to our study dry eye were more common in older age group of patients. Gupta N et al, reported dry eye was more common in older age group than younger.[5]

There were 58% females and 42% male participants in this study. There were a female's preponderance in our study. The higher number of female participants may be due to hormonal disturbance that can affect the tear production in menopausal women and autoimmune diseases which are also common in females. There was female preponderance in dry eye disease in a study by Shreshta E et al.[6] In the Beaver Dam study, dry eye prevalence in men was 11.4% compared with 16.7% in women.[7]

Menopausal women, however are particularly prone to dry eyes. Sex hormones like androgens and estrogens affect tear production. According to several studies being older than 50 years increase your risk of dry eyes, regardless of your sex. In our study, (69%) dry eye female patients were in menopausal age group women. Lambert et al[8] demonstrated that tear production decreases significantly in women aged 50-59 years.

The increase rural prevalence in our study was a direct consequence of the overwhelming exposure of rural residents, largely farmers and manual labourers, to sunlight, high temperature and excessive wind. Climate and environmental challenges such as pollution and extreme temperatures play role in the prevalence of dry eye disease. Both relative humidity and temperature influence the overall thermal climate effect on the precorneal tear film and thus cause dry eye symptoms.[9] We also observed in this study that 28% dry eye patients were associated with the climatic condition like excessive wind and high temperature.

Indoor workers patients such as administrative officers, students, banker, and home maker are more likely to use computers for prolonged period which is one of the risk factors for dry eye. Prolonged Video Display Terminal (VDT) tasks reduce blink rate, blink amplitude and blink quality leading to tear film instability.[10] So dryness of eyes is common after prolonged computer usage. Nine (9%) dry eye patients had indoor office environment and air conditioned.

In our study rheumatoid arthritis was most common systemic disease associated with dry eye, other less commonly diseases were diabetes mellitus and hypertension. In this study we also observed association of dry eye with contact lens users and smoking. Previous studies have also related an increased prevalence of dry eye among smokers.[11]

CONCLUSION

Dry eye disease are prevalent, multifactorial disease that are more common in older age group patients. Female's preponderance were found in the study especially postmenopausal women. Dry eye disease were more

common in patients belongs to rural areas. Climatic condition like excessive wind, high temperature and computers users had strong association with dry eye. Systemic disease associated with dry eye were rheumatoid arthritis, diabetes mellitus and hypertension. Smoking contact lens use were also associated with increased risk of developing dry eye.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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