



CLINICAL PROFILE OF PATIENTS WITH DRY EYE PRESENTING AT A TERTIARY RURAL HOSPITAL

Ophthalmology

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ABSTRACT

The term dry eye can be attributed to the Swedish Ophthalmologist Henrik Sjogren, who described the triad of dry eye, dry mouth and joint pains in the year 1933¹.

DEFINITION - Dry eye is defined as a disorder of the tear film due to tear deficiency or excessive evaporation, which causes damage to the interpalpebral ocular surface and is associated with symptoms of ocular discomfort². This definition was given according to the National Eye Institute (NEI)/Industry Dry Eye Workshop held in 1995 and chaired by Micheal.A.Lemp

It is a symptomatic disease characterised by irritation, soreness, itching, burning and occasional blurring of vision.^[3] Moderate to severe dry eye is associated with significant pain and limitations in doing daily activities, reduced vitality and poor general health.^[4]

It is a major public health problem and is one of the most frequently encountered clinical diagnosis in ophthalmic practice, with a prevalence ranging from 5% to 35%^{[5][6][7]}. This may be attributed to prolonged use of digital devices, environmental pollution and changing lifestyle.

Dry eye was thought to be associated with a decrease in the production of tears but the problem also lies in the quality and not the quantity of tears produced. The two main types of dry eye include aqueous deficient and evaporative type of dry eye. The principal pathological mechanisms of dry eye disease are hyperosmolarity and inflammation. These mechanisms are deeply interrelated and lead to a self-perpetuating "vicious circle".^[8]

With newer diagnostic instruments and recent knowledge of dry eye, we are better equipped to treat this disease, thereby leading to more efficient and effective treatment and patient satisfaction.

KEYWORDS

INTRODUCTION

DEWS defined Dry eye as a multifactorial disease of the tears and ocular surface that leads to symptoms of discomfort,⁹⁻¹¹ visual disturbance,¹²⁻¹⁴ and tear film instability¹⁵⁻¹⁷ with potential damage to the ocular surface. It is also accompanied by increased osmolarity of the tear film¹⁸⁻²¹ and inflammation of the ocular surface^{22,23}.

Dry eye is also recognized as a disturbance of the Lacrimal Functional Unit (LFU), an integrated system comprising the lacrimal glands, ocular surface (cornea, conjunctiva and meibomian glands) and lids, and the sensory and motor nerves that connect them²⁴.

Dry eye may also develop secondary to inflammatory diseases (e.g. vascular, allergic), environmental conditions (e.g. allergens, cigarette smoke, dry climate, air conditioners, increasing use of computers), hormonal imbalance (e.g. postmenopausal women^[25]), patients under hormone replacement therapy), and contact lens wear.^{[26][27][28]}

Females on postmenopausal estrogen therapy, patients exposed to anti-androgens for prostatic cancer tend to show an increase in the signs and symptoms of dry eye. Symptoms of dry eye can be exacerbated by external factors such as contact lens wear and adverse environmental exposures such as arid environments, windy conditions or visual tasking with prolonged exposure.

Systemic disorders, such as diabetes mellitus, thyroid disease, Sjogrens syndrome, rheumatoid arthritis, Steven Johnsons syndrome and systemic lupus erythematosus can also lead to dry eye.

In addition, neurotrophic deficiency, previous eye surgery (such as corneal transplantation, extracapsular cataract procedures and refractive surgery), or long-term use of medications which create hypersensitivity or toxicity in the eye can predispose to dry eye.

AIMS

To study the clinical profile and etiopathogenesis of dry eye in the Ophthalmology OPD of Pravara Rural Hospital, Loni

OBJECTIVES

1. To study the risk factors predisposing to dry eye disease
2. To diagnose dry eye and differentiate it from other causes of irritation of eyes

MATERIALS AND METHODS

The study was conducted in the Outpatient Department of Ophthalmology at Rural Medical College, Loni.

STUDY:

The study was conducted on 335 patients who presented with symptoms suggestive of dry eye. It was a 2 year descriptive cross sectional study done from October 2019 to September 2021.

INCLUSION CRITERIA

- Patients who present with symptoms and signs suggestive of dry eye disease (such as irritation, redness, grittiness, increased blink rate, fluctuating vision, foreign body sensation and decreased tear meniscus) in the Ophthalmology OPD of Pravara Rural Hospital, Loni
- Patients of both genders
- Patients willing to give written informed consent for the study.

EXCLUSION CRITERIA

- Patients not willing to give consent
- Patients of school going age group (below 17 years)
- Patients with acute infective conditions (like conjunctivitis, dacryocystitis, corneal ulcer)
- Patients with enucleated, eviscerated and disfigured eyes

Procedure:

Patients were selected according to the inclusion criteria, for this study. A detailed history including gender, age, place of residence (urban or rural), probable risk factors such as occupation, history of smoking, alcohol, medications, arthritis, refractive and ocular surgeries and other systemic co-morbidities such as diabetes, hypertension was documented.

A complete slit-lamp examination of the lid margins, tear meniscus, conjunctiva, cornea and tear film was done.

Diagnostic tests for dry eye (tear break up time, Schirmer's tests and fluorescein corneal staining) were done. Corneal sensations were tested and results were observed.

OBSERVATIONS AND RESULTS

Table 1. Distribution of study group as per age

Age group (yrs)	N	%
<= 30	63	18.8%
31-50	76	22.7%
51-70	164	49.0%
> 70	32	9.6%
Total	335	100.0%
Mean Age - 51.3 +/- 17.6 years		

Mean age of the cases with dry eye was 51.3 years with over half of the cases (58.6%) were over 50 years of age.

Table 2. Distribution of study group as per Gender

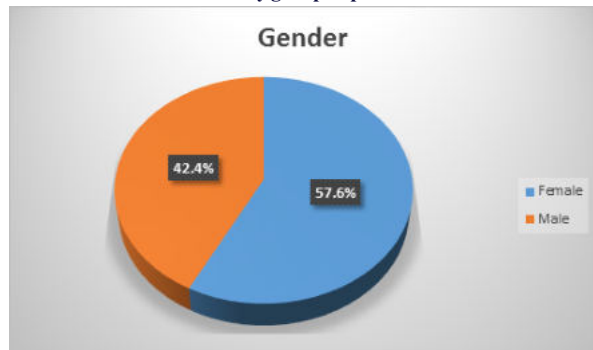


Table 3. Distribution of study group as per type of occupation

Most common occupation in present study cohort was farming (37%) followed by daily wage labourers (16.4%). A total of 95 out of 193 females were housewives (49.2%).

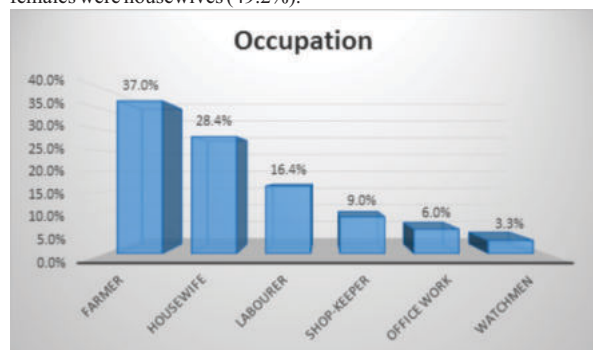


Table 4. Distribution of study group as per presenting symptoms

Most common presenting symptom of dry eye was itching (22.8%) followed by FB sensation (16.4%), redness (13%) and ocular pain (12.1%). Feeling of dryness (11.4%), burning sensation (8.4%), blurring of vision (7.4%), discharge (5.3%) and photophobia (3.2%) were other complaints.

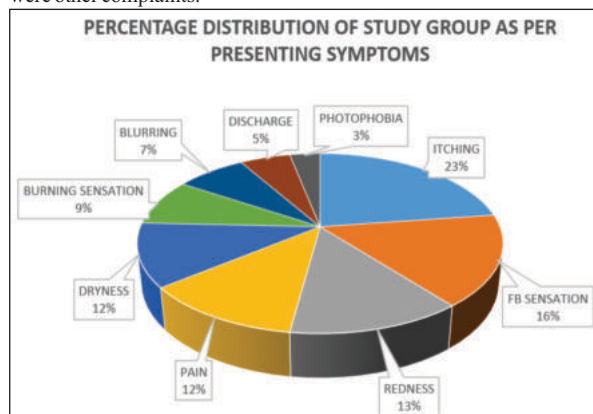


Table 5. Distribution Of Study Group As Per Systemic Risk Factors

SYSTEMIC RISK FACTORS	N	%
HYPERTENSION	87	24%
SJS	74	20.4%
DIABETES	67	18.5%
RA	49	13.6%
SJOGRENS SYNDROME	34	9.4%
MEDICATION	30	8.3%
THYROID DYSFUNCTION	21	5.8%

Most common systemic risk factors were hypertension (24%), SJS (20.4%) and diabetes (18.5%) followed by Rheumatoid arthritis (13.6%), Sjogrens syndrome (9.4%) and thyroid disorders (5.8%). Use

of systemic medications (8.3%) like beta blockers, diclofenac and sulphonamides were seen.

Table 6. Distribution Of Study Group As Per Ophthalmic Risk Factors

OPHTHALMIC RISK FACTOR	N	%
VITAMIN A DEFICIENCY	70	21.6%
HISTORY OF OCULAR SURGERY	62	19.1%
PTERYGIUM	61	18.8%
BLEPHARITIS	61	18.8%
ALLERGIC CONJUNCTIVITIS	40	12.4%
HISTORY OF CONTACT LENS WEAR	30	9.3%

The most common ophthalmic risk factors were Vitamin A deficiency (21.6%) and history of ocular surgery (19.1%). Pterygium and blepharitis were seen in 18.8% cases each. Allergic conjunctivitis was seen in 12.4% cases and 9.3% cases had history of contact lens wear.

Table 7. Association Of Computer Use With Dry Eye

12.5% of the total cases had history of computer use and 69% of these had DED too. Maximum pts (69.9%) with h/o computer use and DED belonged to the 31-59 years age group.

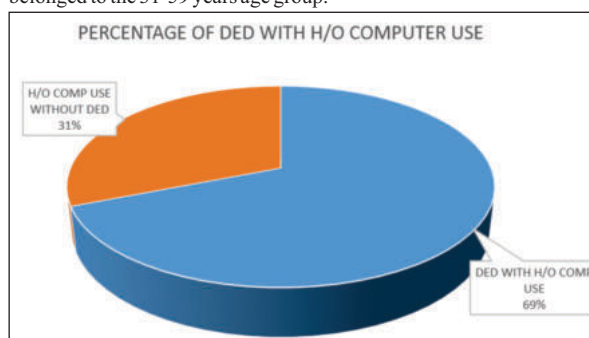


Table 8. Distribution Of Investigations

INVESTIGATION	RE (N)	LE (N)	PERCENTAGE %
SCHIRMER'S TEST POSITIVE	201	201	60%
TEAR FILM BREAK UP TIME POSITIVE	212	211	62%
FLUORESCIN STAIN POSITIVE	145	145	43.2%
CORNEAL SENSATIONS REDUCED	38	38	11.3%

60% cases showed a positive Schirmers test with a score of ≤ 10 mm at the end of 5 mins. 62% cases had a TBUT of < 10 seconds. 43.2% cases showed some amount of fluorescein staining. Corneal sensations were reduced in 11.3% cases.

Table 9. Association Of Severity With Schirmer's Test

SEVERITY	SCHIRMER'S SCORE	N	%
SEVERE DED	0-5	20	6%
MODERATE DED	6-9	76	22.6%
MILD DED	10	105	31.3%
NORMAL	> 10	134	40%

Most cases showed a normal Schirmers score of more than 10mm wetting at the end of 5 mins (40%). 31.3% had an average score of 10mm in both eyes showing that they had mild dry eye. 22.6% cases had an average score between 6mm and 9mm showing that they had moderate dry eye disease. 6% cases had an average score of ≤ 5 mm in both eyes which showed that they had severe dry eye.

DISCUSSION

Dry eye syndrome (DES), also known as dry eye disease (DED), is a multifactorial disease of the tears and the ocular surface that results in discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface^[29]. The prevalence of DED is greatly influenced by geographic location, climatic conditions, and lifestyle of the people and ranges from 5% to 35%^[29-31]. Dry eye may lead to progressive ocular surface disease, increases risk of infections, contact lens intolerance, development of epithelial defects, superficial

punctate keratitis, filamentary keratitis, scarring, ocular surface keratinization, sterile corneal ulceration, corneal thinning, sterile corneal melting leading to perforation, and severe visual loss. Hence, correct diagnosis and appropriate management of dry eye are essential. In the present study, we thus aimed to evaluate the clinical presentation and risk factors for the dry eye disease. Study included 335 patients and was undertaken from October 2019 to September 2021.

Demography

Mean age of the cases with dry eye was 51.3 years with over half of the cases (58.6%) were over 50 years of age. Out of the total 335 cases, 57.6% were females and 42.4% were males.

Shah S et al.^[32] in their study observed the mean age of the study population was 58.6 years with 60% females to 40% males. Baisoya P et al.^[33] in their study observed the mean age as 47.80±16.37 years with female to male ratio of 1.4:1. Kamalakshy J et al.^[34] in their study of 235 dry eye cases, observed that majority of them were in the age group of 50-59 years (26.41%) with mean age of 47.80±16.37 years. Males and females were 122 (51.91%) and 113 (48.08%) respectively. Postmenopausal age group was found to more affected.

Ayub A et al.^[35] observed the mean age as 46.8 ± 8.3 years with 54.3% female patients. Ramnani P et al.^[36] observed mean age of patients as 38.1±17.1 years with 61.6% females. Malladi R et al.^[37] in their study observed a significant proportion (27.55%) of the patients in the age group 51-60 years with mean age of 53.5 years. Alswilem M et al.^[38] in their study observed dry eye disease to be more prevalent in females (76.9%) than males (23.1%). Jaju M et al.^[39] observed dry eye disease, maximum in age group 46 to 60 years (41%), followed by 61-75 years (23%). Female's preponderance was seen compared with male.

Thus we observed dry eye disease to be more common in females especially post-menopausal women. Estrogen and androgen deficiency in menopausal female leads to decrease in tear production from lacrimal gland eventually making postmenopausal female more prone for dry eye disorder^[40].

Occupation

Most common occupation in present study was farming (37%) followed by daily wage labourers (16.4%).

Malladi R et al.^[37] aimed to determine the prevalence and to evaluate the risk factors contributing to dry eye in a hospital-based population.

Most common occupation among cases of dry eye was farming (45.15%) and those involving high sunlight exposure (33.16%). Kamalakshy J et al.^[34] in their study observed that history of outdoor work was given by 60% cases. Jaju M et al.^[39] in their study observed climatic condition like excessive wind, high temperature, sunlight, dust and computers users had strong association with dry eye. Shah S et al.^[32] in their study observed an association between dry eye prevalence and outdoor workers.

Presenting Symptoms

Kamalakshy J et al.^[34] in their study observed most frequent ocular surface symptom in confirmed cases of dry eye was itching (50.94%) followed by foreign body sensation (35.84%), ocular pain (34.59%) and watering (30.18%). Behera S J et al.^[41] in their study observed most frequent symptom as itching (43.55%) followed by watering (36.56%), foreign body sensation (36.02%), ocular pain (29.57%) and redness (26%). Rajeswari RM et al.^[37] in their study observed common presenting symptoms as Foreign body sensation (71.9%), burning sensation (63.77%), itching (57.9%), eye discharge (51.7%) were the commonest symptoms encountered.

In our study, the most common presenting symptoms were itching 22.8% followed by FB sensation in 16.4%, redness in 13%, ocular pain in 12.1%, dryness in 11.4%. Other symptoms reported were burning sensation 8.4%, blurring of vision 7.4%, discharge 5.3% and photophobia 3.2%.

Systemic risk factors

Most common systemic risk factors were hypertension (24%), SJS (20.4%) and diabetes (18.5%) followed by Rheumatoid arthritis (13.6%), Sjogren's syndrome (9.4%) and thyroid disorders (5.8%). Use of systemic medications (8.3%) like beta blockers, diclofenac and sulphonamides were seen.

Kamalakshy J et al.^[34] in their study observed joint pain in 30.8% cases while history of systemic drug use was given by 43.39% cases. Associated systemic disease included hypertension (21.38%), diabetes (13.83%), thyroid disorders (3.13%), SJS (3.14%) and RA (3.77%). Rajeswari RM et al.^[37] in their study observed risk factors as: diabetes (33.16%), followed by smoking (20.9%), pollution (16.5%), drug usage (15.3%). Behera S J et al.^[41] in their study observed systemic drug use in 51.07% cases while associated systemic disease included hypertension (25.8%), diabetes (19.35%), thyroid disorders (2.68%) and RA (3.22%). Chavhan GP et al.^[40] in their study observed systemic risk factors associated with dry eye are hypertension (7.8%), diabetes mellitus (2.9%), thyroid disorder (2.6%), Sjögren's syndrome (1.6%), other connective tissue diseases (1.8%), Steven Johnson syndrome (0.5%). Jaju M et al.^[39] in their study observed that systemic disease like rheumatoid arthritis was commonly associated with dry eye were.

Ocular risk factors

The most common ophthalmic risk factors were Vitamin A deficiency (21.6%) and history of ocular surgery (19.1%). Pterygium and blepharitis were seen in 18.8% cases each. Allergic conjunctivitis was seen in 12.4% cases and 9.3% cases had history of contact lens wear.

Behera SJ et al.^[41] observed ocular risk factors as: allergic conjunctivitis, blepharitis and ocular surgery was observed in 13.33% cases each. Chavhan GP et al.^[40] in their study observed pterygium and blepharitis in 3.1% and 2.9% DED cases respectively. Jaju M et al.^[39] in their study observed that Contact lens use (17%) to be associated with increased risk of developing dry eye. Bhatt R et al.^[42] in their study observed most common association as: Vernal Kerato-Conjunctivitis (VKC), Meibomian Gland Dysfunction (MGD) & Computer Vision Syndrome (CVS) - as over use of mobile. Shah S et al.^[32] in their study observed an association between dry eye prevalence and patients who have undergone previous ocular surgery and those with meibomian gland dysfunction.

Titilal JS et al.^[43] in their study observed that contact lens usage had increased odds of developing severe DED ($P < 0.001$).

Association with use of Computer

A total of 12.5% of the total cases had history of computer use and 69% of these had DED too. Maximum pts (69.9%) with h/o computer use and DED belonged to the 31-59 years age group.

Kamalakshy J et al.^[34] in their study observed that excessive computer use was seen in 23% cases and a significant association was observed with severity of dry eye. Behera SJ et al.^[41] observed excessive computer use in 13.33% DED cases. Bhatt R et al.^[42] in their study observed most common association of DED as Computer Vision Syndrome (CVS) i.e. over use of mobile.

Severity based on schirmers test

Most cases showed a normal Schirmers score of more than 10mm wetting at the end of 5 mins (40%). 31.3% had an average score of 10mm in both eyes showing that they had mild dry eye. 22.6% cases had an average score between 6mm and 9mm showing that they had moderate dry eye disease. 6% cases had an average score of ≤ 5 mm in both eyes which showed that they had severe dry eye.

Baisoya P et al.^[33] in their study of 235 patients of dry eye, observed mild, moderate and severe dry eye was seen in 136 (57.87%), 92 (39.14%) and 3 (1.27%) patients respectively. Malladi R et al.^[37] in their study observed moderate dry eye in 46.17% of patients followed by mild (32.90%) and severe (20.91%). Titilal JS et al.^[43] in their study observed that out of 5000 cases of dry eye disease (DED), 9.9% (496/5000) had mild DED; 61.2% (3060/5000) had moderate DED; and 28.9% (1444/5000) had severe DED.

LIMITATIONS:

One of the reasons for low symptoms in this study could be because most patients in the study were from lower socioeconomic status with lower literacy rates. These patients tend to neglect their ocular symptoms and are more worried about their systemic symptoms.

CONCLUSION

Our study concluded that dry eye disease is more common in older age group patients. Female's preponderance was found in the study especially in post-menopausal women. Among males, it is more common among those who were involved in outdoor work like farming. Most of the cases presented with itching and foreign body sensation. Risk factors associated with dry eye were outdoor occupation, systemic diseases like hypertension and vitamin A

deficiency and ophthalmic factors like pterygium, excessive computer usage, use of contact lens, history of ocular surgery and blepharitis. Severe dry eye disease was observed to be linked with increasing age and outdoor occupation. Knowledge of the common risk factors and clinical spectrum is necessary for early diagnosis and treatment and to have good prognosis.

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