

## CLINICAL PROFILE OF DRY EYE DISEASE AT A TERTIARY CARE CENTRE IN WESTERN ODISHA

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### ABSTRACT

#### BACKGROUND

Dry eye disease is a quite common as well as under-diagnosed disorder of the eye. It causes varying degrees of symptoms of ocular discomfort such as irritation, itching and watering of eyes.

#### MATERIALS AND METHODS

280 consecutive patients attending Ophthalmology OPD with ocular surface symptoms described in dry eye diseases were included in the study. They were subjected to objective tests namely Schirmer's test, Tear break up time and ocular surface stains to confirm the diagnosis of dry eye.

#### RESULTS

Proportion of Dry eye disease was 66.4% in the study population. Majority was in the age group of 50-59 years (26.5%). Females predominated in the study population (60.36%). Postmenopausal age group was found to more affected. Level 2 dry eye was the predominant type in the study group (50.27%).

#### CONCLUSION

Out of the patients presenting with symptoms of ocular surface discomfort, a significant number had Dry eye disease. The prevalence of Dry eye disease increases with advancing age. Another important association is menopause.

#### KEYWORDS

Dry Eye Disease, Ocular Surface Symptom, Itching, Schirmer's Test, Tear Break Up Time, Lissamine Green, Fluorescein Dye.

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#### BACKGROUND

Dry eye disease is a frequent cause of ocular irritation for which patients seek ophthalmic advice. In recent years dry eye is considered as an extremely common condition that causes varying degrees of ocular discomfort and disability. Dry eye syndrome (DES) is a disorder of the pre ocular tear film that results in damage to the ocular surface and is associated with symptoms of ocular discomfort. DES is also called keratoconjunctivitis sicca (KCS), keratitis sicca, sicca syndrome, xerophthalmia, dry eye disease (DED), ocular surface disease (OSD), or dysfunctional tear syndrome (DTS), or simply dry eyes.<sup>1</sup> The International Dry Eye

Workshop (2007) defined dry eye as a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.<sup>2</sup> The general prevalence of dry eye has been reported to vary from 0.46% to 34% (Khurana et al., 1991; Toda et al., 1993; Caffery et al., 1998; Albietsz, 2000; Moss et al., 2000; Sahai and Malik, 2005; Lekhanont et al., 2006).

#### Aim of Study

To estimate the proportion of Dry eye diseases and its clinical profile in patients presenting with ocular surface symptoms to ophthalmology OPD in a tertiary care centre over a period of 2 years.

#### MATERIALS AND METHODS

A prospective, non-randomized, cross-sectional study was carried out in Ophthalmology OPD of VSS Medical College and Hospital, Burla, Odisha on 280 consecutive patients from July 2015 to June 2017. Institutional Ethics Committee approval was obtained prior to commencing the study.

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Patients above the age of 20 years, with any of the ocular surface symptoms like grittiness sensation, non-sticky eye discharge, itching, photophobia, redness, burning/ stinging, heavy sensation, dry sensation, discomfort, ocular pain, watering and temporary blurred vision for minimum one month duration are considered for inclusion in the study population. Patients having active ocular infection and those who had undergone intra-ocular or extra-ocular surgery in the previous six months were excluded. Individuals were enrolled in the study after taking a due informed consent for participation in the study.

This was followed by slit lamp biomicroscopic examination. The lids were examined for presence of any anatomic abnormalities that will interfere with normal spread of tear film. Meibomian orifices were examined for pouting, presence of foam, secretion and plugging. Tarsal conjunctiva was examined for presence of papillae. Presence of mucous threads in the tear film and corneal filaments were noted. The objective tests were done further. Tear break up time (TBUT) and ocular surface staining with fluorescein were done first. This was followed by Schirmer's test.

Tear break up time was tested by instilling a 2% fluorescein strip wetted with saline into the conjunctival sac of either eye. Patient was asked to blink once. The time taken for the appearance of the first randomly distributed dark spot on the cornea was noted under the blue filter of the slit lamp. A value less than 10 seconds was taken as abnormal.<sup>3</sup> Staining pattern with fluorescein dye of conjunctiva and cornea was noted and recorded as nil, mild or diffuse. Lissamine green staining was done next after washing the conjunctival sac and introducing wet Lissamine green strips. Staining pattern of the conjunctiva was noted and graded as nil, mild or extensive.<sup>4</sup>

This was followed by the Schirmer's test. Patient was seated in a room with fans and air conditioners switched off. Proparacaine Hydrochloride 0.5% was instilled into both eyes. Excess local anaesthetic was gently wiped off with cotton. Standard Schirmer's test strip was applied to the inferior conjunctival sac at the junction of lateral 1/3 and medial 2/3. Patient was asked to look straight and allowed to blink. After 5 minutes test strips were removed and the amount of wetting was noted. Tear Break Up Time (TBUT) less than 10 seconds value less than 6 mm in Schirmer's test was taken as dry eye.<sup>5</sup>

Dry eye was graded into 4 Levels, based on the Delphi panel consensus listed as follows.<sup>6</sup>

- Level I- TBUT and Schirmer's score variable, No or mild corneal stain, No to mild conjunctival stain, MGD variably present.
- Level II- TBUT ≤10 seconds, Schirmer's score ≤10 mm, variable corneal fluorescein stain, variable conjunctival stain, MGD variably present
- Level III- TBUT ≤5 seconds, Schirmer's score ≤5 mm, marked central corneal stain. Moderate to marked conjunctival stain, MGD frequent
- Level IV- TBUT immediate, Schirmer's score ≤2 mm, severe punctate erosions, corneal ulcers, marked conjunctival stain, trichiasis, symblepharon

**RESULTS**

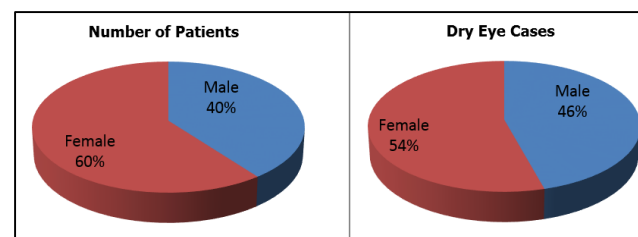
A total of 280 patients with ocular surface symptoms were included in the study. Age ranged from 20 years to 83 years, the mean age being 50.4 years. Majority belonged to the age group of 50-59 (26.5%). Females predominated in the study population (60.36%).

Out of 280 patients who presented with ocular surface symptoms, 186 were diagnosed to have dry eye disease.

The demographic profile of the patient with dry eye population is as follows-

Gender	Number of Patients	Dry Eye Cases
Male	111 (39.64)	85 (45.7)
Female	169 (60.36)	101 (54.3)

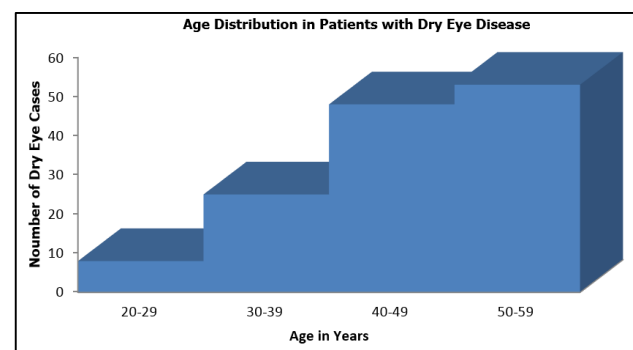
**Table 1. Gender wise Distribution of Patients with Dry Eye Disease**



**Graph 1. Gender wise Distribution of Patients with Dry Eye Disease**

Age Group	Number of Dry Eye Cases	%
20-29	8	4.3
30-39	25	13.44
40-49	48	25.8
50-59	53	28.5
60-69	38	20.43
70-79	14	7.52

**Table 2. Age Distribution in Patients with Dry Eye Disease**



**Graph 2. Age Distribution in Patients with Dry Eye Disease**

Maximum numbers of cases were belonging to 50-59 age group (28.5%).

Occupation	Number of Dry eye Cases
House wife	51 (27.42)
Office/ Indoor workers	38 (20.43)
Manual labourer/ Outdoor workers	97 (52.15)

**Table 3. Distribution of Occupation in Patients with Dry Eye Disease**

Symptoms	Number of Patients	Dry eye Cases (%)
Foreign body sensation	86	67 (36.02)
Non sticky eye discharge	28	19 (10.21)
Itching	142	81 (43.55)
Burning sensation	35	32 (17.2)
Dryness	48	39 (20.96)
Ocular pain	91	55 (29.57)
Watering	105	68 (36.56)
Temporary blurred vision	32	23 (12.36)
Redness	72	49 (26.34)
Photophobia	16	13 (6.98)
Difficulty in eye opening	32	24 (12.9)

**Table 4. Frequency of Ocular Surface Symptoms**

Most common ocular surface symptom in the study population was itching and the least common symptom was photophobia.

Level of Dry Eye	Frequency*	Percentage
1	83	22.31
2	187	50.27
3	76	20.43
4	6	1.34

**Table 5. Levels of Dry Eye Based on the Delphi Panel Consensus**

\*in number of eyes.

Level 2 dry eye was the predominant type in the study group.

Blepharitis was found to be present in 68 patients (36.56%) with dry eye disease. 12 patients had pterygium and one patient had ectropion.

Associated factors	Number of Dry Eye Cases
Joint pain	49 (26.34)
Menopause	72 (71.28)*
Systemic drug use	95 (51.07)
Topical drug use	26 (13.9)

**Table 6. Associated Factors**

\*denominator is the number of female cases.

49 patients had joint pain. 72 female patients were in the post-menopausal age group. 69 out of 186 patients had systemic drug use. Among them, 18 patients were on beta blockers, 15 patients were on calcium channel blockers, 11 were on angiotensin receptor blockers, 20 were on sulfonamide group of drugs. In 31 patients details of systemic drug were not known. 26 patients had topical drug use. 11 of them were using anti allergic drugs. 7 were on anti-glaucoma drugs and 8 were using antibiotic eye drops.

Systemic Diseases	Number Percentage
Hypertension	48 (25.8)
Diabetes mellitus	36 (19.35)
Hypothyroidism	5 (2.68)
Rheumatoid arthritis	6 (3.22)

**Table 7. Frequency of Systemic Diseases Among Dry Eye Cases**

Association with hypertension was found to be the highest (25.8%).

Only two patients were soft contact lens users and both of them had dry eye disorder.

**DISCUSSION**

Out of 280 patients with ocular surface symptoms, 186 patients (66.4%) were diagnosed to have dry eye disease. Reported prevalence of dry eye in the literature is diverse ranging between 7.8% in one study from western world to 93.2% in one study from Asia.<sup>7,8</sup> Asian studies on Dry Eye Disease showed that the prevalence of dry eye is higher than that in western population and ranged between 14.5% and 93.2%. Studies from India reported that the prevalence varies between 18.4% and 64%.<sup>9-14</sup>

Males contributed 45.7% of diagnosed dry eye cases whereas the majority (55.3%) were females. Previous studies also reported that Females are more prone for dry eye.<sup>7,15</sup> An epidemiological study conducted at Schepens Eye Research Institute and Brigham Women’s Hospital showed a prevalence of 7.8% in women over 50 years.<sup>16</sup> In the present study among those who had dry eye 55.3% were females among which 71.3% had attained menopause. Meibomian gland dysfunction & evaporative dry eye frequently occur during menopause.

Most frequent ocular surface symptom in confirmed cases of dry eye was itching (43.6%) followed by watering and foreign body sensation. Photophobia was the least common symptom. In another study conducted in Indonesia burning sensation was the most common symptom.<sup>17</sup> In a study conducted in Gujarat, India, watering was the most common complaint (33.5%) followed by itching sensation (15%).<sup>18</sup>

Level 2 dry eye was the predominant type in the study group with 50.27% of cases as per Delphi panel consensus.

We found the prevalence of dry eye to be 52.15% among labourers or outdoor workers. Khurana et al.<sup>19</sup> too reported an increased risk of dry eye among farmers and labourers (32% and 28% respectively of the dry eye patients) probably due to excessive exposure to adverse environment. This emphasizes the need for creating awareness among the farmers to adopt protective measures during work.

Two patients of the sample were soft contact lens users and both of them had dry eye. It has been found previously that pre-lens tear film thinning time was most strongly associated with dry eye followed by nominal contact lens water content and refractive index. This, together with poor lens wettability, could be a basis for a higher evaporative loss during contact lens wear and was attributed to potential changes in tear film lipid composition.<sup>20</sup>

13.9% of the patients were on topical medications. Many components of eye drop formulations can induce a toxic response from the ocular surface. The most common offenders are preservatives such as benzalkonium chloride, which causes surface epithelial cell damage and punctate epithelial keratitis. This interferes with ocular surface wetting.<sup>2</sup>

Dry eye is known to be associated with certain systemic conditions. In the present study 19.35% of dry eye subjects had diabetes mellitus and hypertension was seen in 25.8% of dry eye cases. The Beaver Dam Eye study also showed similar associations.<sup>21</sup>

### CONCLUSION

This study concludes that a significant number of patients presenting with ocular surface discomfort has Dry eye disease. Itching was the predominant symptom found to be associated with dry eye, followed by watering and foreign body sensation. Probability of diagnosis of Dry eye disease in such patients increases with advancing age and in postmenopausal females. A good history and clinical examination can help us to bring out this under-diagnosed condition and deal with this situation more aggressively. Further studies need to be undertaken to establish a universal diagnostic criterion, concrete etiologic association and options to deal with the same.

### Limitation

As the study population was the out patients in a tertiary health care system it will not exactly correlate with the prevalence and clinical profile of dry eye diseases in the general population.

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