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Proportion of dry eye disease and its clinical profile in patients presenting with ocular surface symptoms to the ophthalmology OPD of a tertiary care centre in South India over a period of one year

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Abstract

Introduction: Dry eye disease is a frequent cause of ocular irritation for which patients seek ophthalmic care. Due to a wide variety of presenting symptoms it is often unrecognized. We come across many patients with ocular surface discomfort for whom empirical dry eye therapy is administered most of the time without confirming whether the symptoms are attributable to a true dry eye condition.

Objective: 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 1 year.

Methodology: 250 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 test, Tear break up time and ocular surface stains to confirm the diagnosis of dry eye and the clinical profile of the confirmed cases of dry eye disease are analysed.

Results: Proportion of Dry eye disease was 63.6% in the study population. Majority was in the age group of 50-59 years (26.41%). Male: Female ratio was 1:3.5.Postmenopausal age group was found to more affected. Systemic diseases like Rheumatoid arthritis (3.77%), Sjögren's syndrome (3.14%) and Hypothyroidism (3.14%) were present in few patients with Dry eye disease.

Conclusion: A significant number of patients presenting with ocular surface discomfort had Dry eye disease. Probability of diagnosis of Dry eye disease in such patients increases with advancing age and postmenopausal status.

Keywords: Dry Eye disease, Ocular surface symptom, Itching, Schirmer test, Tear Break Up Time, Lissamine green, Fluorescein dye

Introduction

Dry eye disease is a frequent cause of ocular irritation for which patients seek ophthalmic care. In recent years dry eye is considered as an extremely common condition that causes varying degrees of ocular discomfort and disability

Dry eye is defined as a multifactorial disease of tears and ocular surface that results in symptoms of discomfort, visual disturbance and tears film instability with potential damage to the ocular surface. It is accompanied by increased osmolality of tear film and inflammation of ocular surface.(1) Dry eye syndrome becomes increasingly prevalent with age and affects 5% of population during 4th decade of life, increasing to 10-15% adults over the age of 65.(2)

Dry eye tends to be ignored as a disease entity because of the vast array and non-specificity of symptoms. We come across many patients with ocular surface discomfort for whom most of the time empirical dry eye therapy is administered without confirming whether the symptoms are attributable to a true dry eye condition. A proper diagnosis of dry eye was not easy in the past by the lack of accepted diagnostic tests. A diagnostic classification scheme for dry eye disorders has recently been established along with guide lines for evaluation of both the disorders and its response to therapy.(3,4)

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 1 year.

Materials and Methods

This cross sectional study was conducted in Dept. of Ophthalmology, Government Medical College, Kottayam. 250 consecutive patients attending ophthalmology OPD over a period of a period of one year, with ocular surface symptoms described in dry eye diseases, satisfying the inclusion criteria were included in the study. 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. Post-operative patients, contact lens wearers and known cases of dry eye under treatment were excluded from study.

Sample size was calculated using the formula n = 4pq/d2

P = prevalence in previous study (18.4%) 31, q= 100-p, d= relative precision

Institutional ethical committee clearance was obtained for this study.

Study procedure: Informed consent was obtained from all the participants after explaining them the purpose of the study. Inclusion and exclusion criteria were confirmed.

A detailed history taking was done including age, sex, occupation, history of allergy, drug intake, joint pain, chemical injury & Steven Johnson syndrome. The presence of any systemic disease, history of ocular surgeries, trauma or contact lens use and ocular medications were noted.

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 (T BUT) and ocular surface staining with fluorescein and Lissamine green were done first. This was followed by Schirmer 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.[5-7]

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.[8,9]

This was followed by the Schirmer 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 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.[10] Tear Break Up Time (TBUT) less than 10 seconds Value less than 6 mm in Schirmer test was taken as dry eye. In needed cases, blood investigations like RA Factor, ANA, Thyroid function test were also done. Patients were classified on the basis of age, sex, occupation, and symptom prevalence, ocular and systemic association.

Dry eye was graded into 4 Levels, based on the Delphi panel consensus listed as follows:[11]

Level 1: TBUT less than 10 seconds, No conjunctival or corneal stain.

Level II: TBUT less than 10 seconds, mild corneal fluorescein stain, mild conjunctival Lissamine stain

Level III: Diffuse corneal stain with fluorescein, extensive conjunctival Lissamine stain

Level IV: Corneal ulcers, epithelial break down

The data collected from 250 patients using a case report form.

Data was entered in excel and analysed using SPSS version 20.

Results

A total of 250 patients with ocular surface symptoms were included in the study. Age ranged from 20 years to 83 years, the mean age being 51.6 years. Majority belonged to the age group of 50-59(27.6%). Females predominated in the study population (78%).

Out of 250 patients who presented with ocular surface symptoms, 159 were diagnosed to have dry eye disease with TBUT<10 seconds (63.6%). 91 patients did not fulfil the criteria for dry eye. Schirmer test was abnormal in 90 patients.

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

Table 1: Age Distribution in patients with dry eye disease

Age Group	No of dry eye cases	Percentage
20-29	11	6.9
30-39	25	15.72
40-49	39	24.52
50-59	42	26.41
60-69	32	20.12
70-79	10	6.28
80-89	0	0

Maximum numbers of cases were belonging to 50-59 age group. There were 35 males (22.01%) and 124 females(77.99%) with dry eye disease.

The number of female patients in the study population and the confirmed dry eye cases outweighed the number of male population.

Table 2: Distribution of occupation in patients with dry eye disease

Occupation	Number of Dry eye cases (%)
House wife	96(60.37)
Office worker	45(28.30)
Manual labourer	18(11.32)

Table 3: Frequency of Ocular Surface Symptoms

Symptoms	Number of patients	Dry eye cases
Foreign body sensation	72	57 (35.84)
Non sticky eye discharge	18	14 (8.8)
Itching	142	81 (50.94)
Burning sensation	35	32 (20.12)
Dryness	48	39 (24.52)
Ocular pain	91	55 (34.59)
Watering	85	48 (30.18)
Temporary blurred vision	32	23 (14.46)
Redness	72	49 (30.81)
Photophobia	16	13 (8.17)
Difficulty in eye opening	32	24 (15.09)

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

Table 4: Levels of dry eye based on the Delphi panel consensus

Level of Dry eye	Frequency*	Percentage
1	73	22.9
2	167	52.51
3	76	23.89
4	2	0.6

*in number of eyes

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

Corneal filaments were present in 42 cases.

Blepharitis was found to be present in 68 patients (42.76%) with dry eye disease. 5 patients had pterygium and one patient had ectropion.

Table 5: Associated factors

Associated factors	Number of dry eye cases (%)
Joint pain	49(30.81)
Menopause	68(54.83)*
Systemic drug use	69(43.39)
Topical drug use	16(10.06)

*denominator is the number of female cases.

49 patients had joint pain. 68 female patients were in the post-menopausal age group. 69 out of 159 patients had systemic drug use. Among them, 18 were using antihistamines frequently. 12 patients were on beta blockers, 15 patients were on calcium channel blockers, 5 were on angiotensin receptor blockers, 15 were on sulfonyl urea group of drugs. In 4 patients details of systemic drug were not known. 16 Patients had topical drug use. 6 of them were using anti allergic drugs. 8 were using beta blocker and 2 were using antibiotic eye drops.

Table 6: Frequency of systemic diseases among dry eye cases

Systemic diseases	Number (%)
Hypertension	34 (21.38)
Diabetes mellitus	22 (13.83)
Hypothyroidism	5(3.14)
Rheumatoid arthritis	6 (3.77)
Sjogrens syndrome	5 (3.14)

Association with hypertension was found to be the highest (21.38%).

Discussion

Out of 250 patients with ocular surface symptoms, 159 patients (63.6%) 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.[12,13] 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 63 %.[14-18]

Present study is a cross sectional study conducted in clinical setting. Due to the difficulty in carrying out longitudinal studies on dry eye in a sufficiently large population group, cross sectional prevalence studies have been reported in literature.[19] Prevalence in clinic population is usually higher than that for general population. The reported prevalence varies between 0.6% and 57%.[20- 22]

Most frequent ocular surface symptom in confirmed cases of dry eye was itching (50.94%) followed by foreign body sensation and ocular pain. Photophobia was the least common symptom. In another study conducted in Indonesia burning sensation was the most common symptom.[23]

TBUT was positive in 63.6% cases indicative of dry eye. Schirmer test, indicative of aqueous tear deficiency was positive only in 56.6% of dry eye cases.

Males contributed 22.01% of diagnosed dry eye cases whereas the majority (77.99%) were females. Dry eye was more among housewives in this study. Previous studies also reported that Females are more prone for dry Eye.[12,24] 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. In the present study among those who had dry eye 77.98% were females among which 54.83% had attained menopause. Meibomian gland dysfunction & evaporative dry eye frequently occur during menopause. As menopause sets in, an imbalance between oestrogen and androgens, due to decrease in androgen levels can occur.

In present study maximum number of patients having dry eye were house wives (60.37%) when compared to other groups. It is comparable to a hospital based study conducted in Kerala in 2007-2008 in which

maximum numbers of dry eye patients were also house wives-53%.[18]

In the present study dry eye was more prevalent in age group of 50-59 years. Other studies also showed increasing prevalence with age.[20,23] The Beaver Dam Eye study which was one of the first to report the incidence of dry eye, found a peak at 70-80 years of age.[20]

Blepharitis was an association in 42.76% eyes of our patients. Other studies have reported an association as high as 56%.[25] A large proportion of patients with chronic blepharitis show marked changes in meibomian gland structure. The changes in lipid layer leads to increased evaporation of tear and resultant dry eye.[25] The frequent association of dry eye with blepharitis has been documented by several investigators. Ectropion was noticed in one patient in present study.

Dry eye is known to be associated with certain systemic conditions. In the present study 13.83% of dry eye subjects had diabetes mellitus. 3.77% had Rheumatoid arthritis and 3.14% had thyroid disease & 3.14% had Sjogrens syndrome. Hypertension was seen in 21.38% of dry eye cases. In present study ANA profile for Sjogrens syndrome was positive in 3.14% cases. RA Factor positive in 3.77% cases. The Beaver Dam Eye study also showed similar associations.[20] Systemic drug use was there in 43.39% patients and topical drug use in 10.06%. Use of beta blockers and antihistamines were found to be more associated with dry eye.[26] Systemic or topical ocular medications and preservatives used in topical ocular drugs may cause dry eye through the drug's therapeutic action, ocular surface effects, or preservatives, and the effects probably are additive.[27,28]

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 foreign body sensation. Probability of diagnosis of Dry eye disease in such patients increases with advancing age and in postmenopausal females.

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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