



## Original Article

# Clinical Presentations of Dry Eye in Senior citizens of a tertiary care Eye hospital

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## Abstract

**Objective:** To study Clinical presentations of dry eye in senior citizens of a tertiary care eye hospital

**Study Design:** Hospital based prospective observational study.

**Materials and Methods:** In this hospital based prospective observational study 260 eyes of 140 patients of dry eye above the age of 60 years, attending OPD of a tertiary care hospital were evaluate for various manifestations of dry eye. The study was carried out during the span of 1 years from December 2016 to December 2017. The patients of age 60 years or above presenting with any complaint suggestive of dry eye or diagnosed case of dry eye were evaluated in detail with reference to presenting complaints, history, personal habits, occupation, detail slit lamp examination and various investigation like schirmer's test, tear meniscus, ocular surface staining, Tear flim breakup time (TBUT) and corneal sensation.

**Results:** Mean age of study group was 68.04 year  $\pm$ 7.2 (60-91) years. Out of 140 patients 57 (40.71%) were male and 83 (59.28%) were female. 85.71% patients had bilateral involvement rest had unilateral involvement. Grittiness (84.28%), Burning Sensation (66.42%) and Mucous Discharge (57.85%) were the common symptoms noted in present study. Conjunctival congestion (100%) was the most common sign of dry eye which was present in all cases and all grade of dry eye. Mucous thread (67.6%), Tear debris (47.6%) and epithelial erosion (38.0%) were the other common sign noted in present study. In present study 51.53% eyes had mild grade of dry eye followed by 36.53% eyes had moderate grade and 11.92% eyes had severe grade of dry eye. Mild and Moderate grade of dry eye was more common in female as compare to severe grade of dry eye which was nearly equal in both gender.

**Conclusion:** Elderly could be affected by any grade of dry eye but usually mild and moderate grade of dry eye are more common than severe grade of dry eye. Dry eye can present with vague and nonspecific sign and symptoms in elderly.

**Keywords:** Dry eye, Elderly, Clinical profile.

## Introduction

Dry eye is a multi-factorial disease of the tear film and ocular surface that results in discomfort, visual disturbance and tear-film instability with potential damage to the ocular surface, and

accompanied by increased tear osmolarity and inflammation. In recent years, dry eye is an extremely common condition that causes varying degree of ocular discomfort and disability.

Asian studies on dry eye showed that the prevalence of dry eyes is higher in Asian population than the western population and it is between 14.5%-93.2%.<sup>1-6</sup> The prevalence of dry eye in India is ranging from 18.4% to 40.8%.<sup>1-3</sup> This variation is because of lack of uniformity in the diagnostic criteria of dry eye.

Aging is a one of most important risk factor for dry eye. Dry eye is more frequents in individual aged 50 years or older. Age related reduction in tear production and tear flow, increased tear evaporation and decreased corneal sensitivity are the causes of age related dry eye.<sup>7-10</sup>

Dry eye either alone or in combination with other conditions, is a frequent cause of ocular irritation that leads the patients to seek ophthalmic care. The patients with dry eye present with variety of non specific symptoms and it is often unrecognized or misdiagnosed. Reason behind this is that Information is limited on dry eyes due lack of uniformity in its definition and the inability of any single diagnostic test or sets of diagnostic tests to confirm or rule out the condition. Thus, there has been a shift towards symptom-based assessment as the key component of clinical diagnosis. In many cases, dry eye can be a cause of significant visual morbidity, ocular surface damage and may compromise the results of cataract, corneal and refractive surgery. Dry eye is one of condition that can be managed at all levels of ophthalmic care. Only severe grades of dry eye and those with associated systemic diseases needs expert opinion as well as evaluation by other fraternities like Rheumatologist. In many cases disease is not curable so education of patients regarding nature of disease, effect of aging, personal habits, occupation and environmental conditions on the disease is also important.

### Method & Material

In this hospital based prospective observational study 260 eyes of 140 patients of dry eye above the age of 60 years, attending OPD of tertiary eye

care center were evaluate for various clinical manifestation of dry eye. The study was being carried out during the span of 1 year from December 2016 to December 2017.

The patients of age 60 years or above presenting with any complaint suggestive of dry eye or diagnosed case of dry eye were evaluated in detail with reference to presenting complaints, history, personal habits, occupation, detail slit lamp examination and various investigation like schirmer's test, tear meniscus, ocular surface staining, Tear film breakup time (TBUT) and corneal sensation. After detailed evaluation, all eyes were analyzed for various clinical presentations.

### Inclusion Criteria

- Patients of age 60 years or above presenting with complaints suggestive of dry eye and positive for any test for dry eye.
- All diagnosed cases of dry eye of age 60 year or above.

### Exclusion Criteria

- Patients of age less than 60 years.
- Patients presenting with some other condition explaining the complaints similar to dry eye.

### Results

The present study was carried out on 260 eyes of 140 patients of age  $\geq 60$  years. Out of 140 patients 57 (40.71%) were male and 83 (59.28%) were female. 85.71% patients had bilateral involvement rest had unilateral involvement. Mean age of study group was 68.04 year  $\pm 7.2$  (60-91) years.

**Table-1** Characteristics of Study Group

Characteristics	Number	%
Total patients	140	
Total eyes	260	
Bilateral involvement	120	85.71
Unilateral involvement	20	14.28
Male	57	40.71
Female	83	59.28
Mean age	68.04 $\pm$ 7.2	

**Table-2** Distribution of the Patients according to age and Gender

S.N.	Age (in years)	Gender Distribution				Total Patients (in each group)
		M	%	F	%	
1	60-69	29	20.71	44	31.42	73
2	70-79	20	14.28	30	21.42	50
3	80-89	6	04.28	8	05.71	14
4	≥90	2	01.42	1	00.7	3
<b>Total</b>		57	40.71	83	59.28	140

The age of patients ranged from 60 to 91 year. Most patients belong to the 60-69 year age group.

**Table-3** Distribution of the cases according to Symptoms

S.N.	Symptoms	No. of Cases	%
1	<b>Grittiness</b>	118	84.28
2	<b>Burning sensation</b>	93	66.42
3	<b>Mucous discharge</b>	81	57.85
4	<b>Fatigue</b>	75	53.57
5	<b>Dryness</b>	72	51.42
6	<b>Redness</b>	69	49.28
7	<b>Blurring of vision</b>	58	41.42
8	<b>Itching</b>	52	37.14
9	<b>Watering</b>	33	23.57
10	<b>Photophobia</b>	18	12.85

As shown in above table Grittiness (84.28%), Burning Sensation (66.42%) and Mucous Discharge (57.85%) were the most common symptoms noted in present study followed by

Fatigue (53.75%), Dryness (51.42%), Redness (49.28), Blurring of vision (41.42%), Itching (37.14%), Watering (23.57%) and photophobia (12.85%).

**Table-4** Distribution of the eyes according to Signs

SIGNs	Grade of Dry Eye						Total no. of eyes	Total %
	Mild (134)		Moderate (95)		Severe (31)			
	No.	%	No.	%	No.	%		
<b>Conjunctival congestion</b>	134	100	95	100	31	100	260	100
<b>Mucous thread</b>	63	47.0	83	87.3	30	96.7	176	67.6
<b>Tear debris</b>	49	36.5	50	52.6	25	80.6	124	47.6
<b>Epithelial erosion</b>	19	14.1	51	53.6	29	93.5	99	38.0
<b>Froth in tear</b>	42	31.3	36	37.8	14	45.1	92	35.3
<b>Filaments</b>	15	11.1	35	36.8	25	80.6	75	28.8
<b>Loss of conjunctival and corneal luster</b>	8	5.9	29	30.5	30	96.7	67	25.7
<b>Crust and waxy scales over lid margins</b>	13	9.7	10	10.5	13	41.9	36	13.8

In present study conjunctival congestion (100%) was the most common sign of dry eye which was present in all cases and all grade of dry eye. Mucous thread (67.6%), Tear debris (47.6%) and epithelial erosion (38.0%) were the other common sign noted in present study followed by Frothy discharge (35.3%), mucous filaments (28.8%), Loss

of conjunctival/corneal luster (25.7%) and Crusting of lid margins (13.8%).

**Table-5** Distribution of the eyes according to Schirmer’s Test

S.N.	SCORE	Wetting in mm/ 5min	No. of eye	%
1	0	>10	80	30.71
2	1	5-10	99	38.07
3	2	3-4	55	21.12
4	3	0-2	26	10
<b>Total</b>			<b>260</b>	

In present study 30.7% eyes had normal (>10 mm) and 69.3% eyes had abnormal (<10 mm) value of schirmer’s test -I. Most of the eyes had

schirmer’s test-I between 5-10mm (38.07%) followed by >10mm (30.71%), 3-4mm (21.12%) and 0-2mm (10%).

**Table-6** Distribution of the eyes according to TBUT

S.N.	Score	TBUT in sec	No. of eyes	%
1	0	>10	0	0
2	1	6.1-10	132	50.76
3	2	3.1-6	96	36.92
4	3	0-3	32	12.30
<b>Total</b>			<b>260</b>	

As shown in above table all eyes had TBUT score ≤ 10 sec. Out of 260 eyes nearly 50% eyes had

TBUT score between 6.1-10 sec, 36.92% eyes had 3.1-6 sec and 12.3% eyes had 0-3sec TBUT score.

**Table-7** Distribution of the eyes according to tear Meniscus

S.N.	Score	Tear meniscus	No. of eyes	%
1	0	Intact	80	30.76
2	1	Scanty	100	38.46
3	2	Markedly diminished	49	18.84
4	3	Absent	31	11.92
<b>Total</b>			<b>260</b>	

Tear meniscus was intact in 30.76% eyes and scanty in 38.46% eyes, rest of the eyes had either

markedly diminished (18.84%) or absent (11.92%) tear meniscus.

**Table-8** Distribution of the eyes according to Fluorescein Staining

S.N.	Score	Fluorescein staining	No. of eyes	%
1	0	Absent	161	61.90
2	1	Fine punctuate	55	21.15
3	2	Coarse punctuate	27	10.38
4	3	Diffuse	17	6.53
<b>Total</b>			<b>260</b>	

Out of 38.06% fluorescein stain positive eyes 21.15% eyes had fine punctate, 10.38% had coarse punctate and 6.53% had diffuse fluorescein

staining. 61.90% eyes was fluorescein stain negative.

**Table-9** Distribution of the eyes according to Rosebengal Staining (Van Bijsterveld Score)

S.N.	Score	ROSE BENGAL staining	No. of eyes	%
1	0	0-3	105	40.38
2	1	4-5	81	31.15
3	2	6-7	55	21.15
4	3	8-9	19	7.30
<b>Total</b>			<b>260</b>	

As shown in above table in present study most of the eyes had Van Bijsterveld score of Rose Bengal

staining between 0-3 (40.38%), followed by 4-5 (31.15%), 6-7 (21.15%) and 8-9 (7.3%).

**Table-10** Distribution of the eyes According to Lissamine Green Staining (Van Bijsterveld Score)

S.N.	Score	LISSAMINE GREEN staining	No. of eyes	%
1	0	0-3	109	41.92
2	1	4-5	79	30.38
3	2	6-7	53	20.38
4	3	8-9	19	7.30
<b>Total</b>			<b>260</b>	

As shown in above table in present study most of the eyes had Van Bijsterveld score of Lissamine

green staining between 0-3 (41.92%), followed by 4-5 (30.38%), 6-7 (20.38%) and 8-9 (7.30%).

**Table-11** Distribution of the eyes according to Severity

S.N	Total Score	Grade of Dry Eye	No. of Eyes				%	
			Male	%	Female	%		
1	3-8	Mild	51	19.61	83	31.92	134	51.53
2	9-13	Moderate	40	15.38	55	21.15	95	36.53
3	14-18	Severe	16	6.15	15	5.76	31	11.92
<b>Total eyes</b>			<b>107</b>	<b>+</b>	<b>153</b>	<b>=</b>	<b>260</b>	

In present study 51.53% eyes had mild grade of dry eye followed by 36.53% eyes had moderate grade and 11.92% eyes had severe grade of dry eye. Mild and Moderate grade of dry eye was more common in female as compare to severe grade of dry eye which was nearly equal in both gender.

**Discussion**

Dry eye syndrome is a multifactorial disease of the tear film and ocular surface resulting in eye discomfort and compromised visual quality. Dysfunction of any component of the lacrimal gland, ocular surface, eyelids, and nerve connecting them can cause dry eye.

Grittiness (84.28%), Burning Sensation (66.42%) and Mucous Discharge (57.85%) were the most common symptoms noted in present study. JD Nelson<sup>11</sup> observed that KCS patients complaint more of foreign body than burning. Patients with blepharitis commonly complain burning more than foreign body sensation. RM Sahai et al<sup>12</sup> in their study on dry eye found that among patients who had dry eye discharge was commonest complaints. Fatigue (53.75%), Dryness (51.42%), Redness (49.28), Blurring of vision (41.42%), Itching (37.14%), Watering (23.57%) and Photophobia (12.85%) were the other symptoms reported in present study. RM Sahai et al<sup>12</sup> also found similar symptoms discharge, foreign body

sensation, irritation, burning, tiredness, transient blurring of vision, itching and photophobia.

In present study conjunctival congestion (100%) and Mucous thread (67.6%) was the most common sign of dry eye which was present in most cases and all grades of dry eye. This finding of present study is consistent with finding of RM Sahai et al<sup>12</sup> and Sjögren H and Bloch KJ.<sup>13</sup> Tear debris (47.6%) and epithelial erosion (38%) was the other common sign noted in present study followed by Frothy discharge (35.3%), mucous filaments (28.8%), Loss of conjunctival/corneal luster (25.7%) and Crust and waxy scales over lid margins (13.0%). Similar signs of dry eye were reported by Mitchell H Friedlaender<sup>14</sup>

Holly FJ and Lemp MA<sup>15</sup> considered 5 mm wetting of schirmers strip at 5min to be safest cutoff value for of aqueous tear deficiency. JD Nelson<sup>11</sup> and Tabbara KF & Wagoner MD<sup>16</sup> reported value <10 mm to be suggestive of aqueous tear deficiency. In present study we have taken Schirmer test value ≤ 10 as abnormal and suggestive of tear deficient dry eye. In present study 30.7% eyes had normal (>10 mm) and 69.3% eyes had abnormal (<10 mm) value of Schirmer’s test. Most of the eyes had Schirmer’s test between 5-10mm (38.07) followed by >10mm (30.71%), 3-4mm (21.12%) and 0-2mm (10%).

Tear meniscus was intact in 30.76% eyes and scanty in 38.46% eyes, rest of the eyes had either

markedly diminished (18.84%) or absent (11.92%) tear meniscus. Mitchell H Friedlaender<sup>14</sup> also describes identical pattern of tear meniscus to be indication of ATD.

In present study we reported all eyes had unstable tear film with TBUT score  $\leq 10$  sec. Holly FJ and Lemp MA<sup>15</sup> also reported TBUT values  $<10$ sec to be evidence of tear film instability.

In present study we found that fluorescein staining (1-2% dye) is useful to assess the degree of epithelial defect, areas of superficial punctate keratitis or filamentary keratitis and helpful in assessing type and extent of surface exposure. Out of 38.06% fluorescein stain positive eyes 21.15% eyes had fine punctate, 10.38% had coarse punctate and 6.53% had diffuse fluorescein staining. 61.90% eyes was fluorescein stain negative. Similar observation was noted by Norn MS<sup>17</sup>

In present study we followed Van Bijsterveld scoring system for Rose Bengal and lissamine green stain. We found that lissamine green has a nearly similar staining profile as Rose Bengal. This result is consistent with the study of Norn MS<sup>17</sup>

We also reported that in early dry eye staining was absent or limited to exposure zone of nasal conjunctiva. In moderate dry eye staining also involve exposure zone of temporal conjunctiva. In severe dry eye staining involve cornea with in exposure zone. Similar result also noted by Jeffery P Gilbard<sup>18</sup>

We further observed that the Interpalpebral staining of the cornea and conjunctiva is more consistently seen in aqueous tear deficiency whereas inferior corneal and conjunctival staining is more consistent with MGD, blepharitis or exposure. Similar pattern of staining was also reported by Manning FJ et al.<sup>19</sup> and Pflugfelder SC and Tseng SC et al<sup>20</sup>.

Lemp MA<sup>21</sup>, JD Nelson<sup>11</sup>, Khurana et al.<sup>22</sup>, Murube J and Tsubota K<sup>23</sup> and Tabbara KF and Wagoner MD<sup>16</sup> described staging of dry eye to grade the dry eye in to various grade of severity. In present study we followed grading system of

Khurana et al to classify dry eye into mild, moderate and severe grades. Out of 260 eyes 51.53% eyes had mild grade of dry eye followed by 36.53% eyes had moderate grade and 11.92% eyes had severe grade of dry eye.

## Conclusion

We conclude from present study

- 1) Dry eye is more common in old age and affects women more commonly than men.
- 2) Grittiness (84.28%), Burning Sensation (66.42%) and Mucous Discharge (57.85%) are the most common presenting symptoms of dry eye in old age.
- 3) Conjunctival congestion and mucous threads is the common signs of dry eye in senior citizens.
- 4) Senior citizens could be affected by any grade of dry eye but usually mild and moderate grade of dry eye is more common than severe grade of dry eye.

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