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

Author
Dr Rishi Gupta
Senior Resident, Sankara Nethralaya, Kolkata, India
Corresponding Author
Dr Rishi Gupta
Email: grishi09@gmail.com

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 film breakup time (TBUT) and corneal sensation.
Results: Mean age of study group was 68.04 year ±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%. The prevalence of dry eye in India is ranging from 18.4% to 40.8%. This variation is because of lack of uniformity in the diagnostic criteria of dry eye.

Aging is one of the most important risk factors for dry eye. Dry eye is more frequent in individuals 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.

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 the conditions that can be managed at all levels of ophthalmic care. Only severe grades of dry eye and those with associated systemic diseases need 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 evaluated for various clinical manifestations 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 years 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 ≥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 ±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±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                         |
| Total|                | 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    | Grittiness           | 118          | 84.28  |
| 2    | Burning sensation   | 93           | 66.42  |
| 3    | Mucous discharge    | 81           | 57.85  |
| 4    | Fatigue             | 75           | 53.57  |
| 5    | Dryness             | 72           | 51.42  |
| 6    | Redness             | 69           | 49.28  |
| 7    | Blurring of vision  | 58           | 41.42  |
| 8    | Itching             | 52           | 37.14  |
| 9    | Watering            | 33           | 23.57  |
| 10   | Photophobia         | 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 |
|-----------------------------------------------|------------------|
|                                               | Mild (134)       | Moderate (95)  | Severe (31)   | Total no. of eyes | Total %  |
|                                               | No.   | %     | No.   | %     | No.   | %     |                   |
| Conjunctival congestion                       | 134   | 100   | 95    | 100   | 31    | 100   | 260               | 100     |
| Mucous thread                                 | 63    | 47.0  | 83    | 87.3  | 30    | 96.7  | 176               | 67.6    |
| Tear debris                                   | 49    | 36.5  | 50    | 52.6  | 25    | 80.6  | 124               | 47.6    |
| Epithelial erosion                            | 19    | 14.1  | 51    | 53.6  | 29    | 93.5  | 99                | 38.0    |
| Froth in tear                                 | 42    | 31.3  | 36    | 37.8  | 14    | 45.1  | 92                | 35.3    |
| Filaments                                     | 15    | 11.1  | 35    | 36.8  | 25    | 80.6  | 75                | 28.8    |
| Loss of conjunctival and corneal luster       | 8     | 5.9   | 29    | 30.5  | 30    | 96.7  | 67                | 25.7    |
| Crust and waxy scales over lid margins        | 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     |
|      |       |                    | **Total** 260 |        |

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 TBUT score between 5-10 mm (38.07%) followed by >10 mm (30.71%), 3-4 mm (21.12%) and 0-2 mm (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  |
|      |       | Total       | **260**     |        |

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 0-3 sec 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  |
|      |       | **Total**         | **260**     |        |

Tear meniscus was intact in 30.76% eyes and markedly diminished (18.84%) or absent scanty in 38.46% eyes, rest of the eyes had either (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   |
|      |       | **Total**            | **260**     |        |

Out of 38.06% fluorescein stain positive eyes staining. 61.90% eyes was fluorescein stain 21.15% eyes had fine punctate, 10.38% had negative, coarse punctate and 6.53% had diffuse fluorescein.

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   |
|      |       | **Total**            | **260**     |        |

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  |
| **Total** |     |                           | **260**     |       |

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 | | |
|-----|-------------|------------------|-------------| | % | % | % |
| 1   | 3-8         | Mild             | Male | 51   | 19.61 | 83   | 31.92 | 134 | 51.53 |
| 2   | 9-13        | Moderate         | Male | 40   | 15.38 | 55   | 21.15 | 95  | 36.53 |
| 3   | 14-18       | Severe           | Male | 16   | 6.15  | 15   | 5.76  | 31  | 11.92 |
|     |             |                  | Female | 51   | 19.61 | 83   | 31.92 | 134 | 51.53 |
|     |             |                  | Female | 40   | 15.38 | 55   | 21.15 | 95  | 36.53 |
|     |             |                  | Female | 16   | 6.15  | 15   | 5.76  | 31  | 11.92 |
| **Total eyes** |     |                  |           | 107  | 51.53 | 153  | 51.53 | 260 |       |

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 observed that KCS patients complaint more of foreign body than burning. Patients with blepheritis commonly complain burning more than foreign body sensation. RM Sahai et al and colleagues 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 al12 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 al12 and Sjögren H and Bloch KJ.13 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 and Holly FJ and Lemp MA considered 5 mm wetting of schirmer's strip at 5min to be safest cutoff value for of aqueous tear deficiency. JD Nelson and Tabbara KF & Wagoner MD 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
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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