

**Prevalence of Dry Eye in Post-Menopausal Women - Study from North India.**

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**Abstract**

**Background:** A disorder of tear film is tear instability, the tear film instability can lead to vision-threatening complications by causing dry eye syndrome & hence early diagnosis is important. Various aspects of the integrity of the tear film can be measured by clinical tests as Schirmer's test, tear film break up time (TBUT) and vital dye staining of the ocular surface.

**Objective:** To study the prevalence of dry eye among postmenopausal women.

**Methodology:** The present cross-sectional study was conducted at postgraduate department of Ophthalmology of GMC Jammu over a period of two year. Total of 500 postmenopausal women were included in the study. Detailed history was taken from the patient & relevant ocular examination was done. Both Schirmer's test-1&2 were estimated in all patients. A Schirmer's test of less than 10mm, basal tear secretion of less than 10mm were considered positive. Grading of dry eye was done according to drew's classification.

**Results:** The most frequently occurring symptom was burning sensation 350(70%), followed by grittiness in 245(49%). The Schirmer-1 was positive in 230 whereas Schirmer-2 was positive in 189. Both Schirmer's 1&2 were positive in 189 women. The prevalence of dry eye in postmenopausal women in present study was 37.8%.

**Conclusion:** From present study it has been concluded that there is high prevalence of dry eye in postmenopausal women i.e 37.8%. Thus ,dry eye is a hidden disorder which affects significant number of female population in the post-menopausal age group. Dry eye tests should be performed in postmenopausal patients and appropriate tear substitutes should be prescribed based on these results.

**Keywords:** Dry eye, Tear secretion, Schirmer test.

**Introduction**

A significant percentage of the population, particularly in those older than 40 years throughout the world is affected by a common disorder called as dry eye. The National Eye Institute/Industry Workshop published the definition of dry eye states and a new classification in

1995 which states that “Dry eye is a disorder of the tear film due to tear deficiency or excessive tear evaporation which causes damage to the interpalpebral ocular surface and is associated with symptoms of ocular discomfort.” The definition and classification of dry eye was updated in 2007 during the tear film and ocular surface (TFOS) dry eye work shop (DEWS). “Dry eye is 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>1</sup> Its prevalence is very common among post-menopausal women as compared to men of same age group. Eye is a locus of action of female sexual hormones according to a study by Kramer P et al.<sup>2</sup> The reduction of naturally occurring estrogen among post-menopausal women is one of the possible reason for the occurrence of dry eye in them.<sup>3</sup> A large proportion of post-menopausal women, according to a study presented at the American Academy of Optometry were found predominantly related meibomian gland dysfunction causing dry eye . Over 90% of women showed some form of meibomian gland dysfunction, making it the major contributor to dry eye.<sup>4</sup> Various aspects of the integrity of the tear film and ocular surface can be measured by tests such as Schirmer test, tear film break up time (TBUT) and vital dye staining of the ocular surface. Dry eye can range from mild to severe; Risk factors of dry eye are increasing age, male sex, occupation, smoking and pterygium. Patients with decreased tear production are more prone to the damaging effects of UV rays in the sun.<sup>1</sup> Dry eye symptoms may be a manifestation of a systemic disease, therefore timely detection is important which may lead to recognition of a life-

threatening condition. Blinding infections, such as bacterial keratitis and increased risk of complications following common procedures such as laser refractive surgery are more among dry eye patients.<sup>4</sup>

#### **Material and method:**

The present study was cross-sectional conducted on 500 post-menopausal patients at the Out Patient Department of Upgraded Department of Ophthalmology, Government Medical College, Jammu over a period of two years. The informed consent from all the patients were undertaken before inclusion in the current study. The data was recorded by independent observer. All the women were tested for the dry eye disease. The diagnosis was established based on Schirmer’s test. Grading of dry eyes was done according to DREWS classification.

**Inclusion Criteria:** All women who have reached menopause.

**Exclusion criteria:** Subject with systemic diseases\syndromes associated with dry eye (e.g. Sjogren’s syndrome), subject on systemic medication (e.g. diuretics, psychotropic’s, that leads to ocular drying), contact lens users, subjects having other adnexal disease, anterior or posterior segment disease which alters tear secretion and stability, patients having recent ocular surgery (e.g. cataract surgery), patients on topical antiglaucoma medications/any other topical drug that leads to ocular drying, those who did not gave consent.

After meeting the inclusion & exclusion criteria all patients were worked out in detail in the department of ophthalmology as under:

- (1) Detailed history pertaining to symptoms was recorded – onset, duration, any aggravating factor.
- (2) The patients were subjected to a routine general physical examination.

(3) Every patient underwent a detailed ophthalmic examination as (a) external eye examination: includes examination of eyelids, conjunctiva, cornea, iris, pupil, lens, (b) visual acuity (both distance & near vision), (c) slit lamp examination: to visualize the anterior segment of the eye, (d) the following tests were performed as given below.

**Schirmer's test:** (a) Without anesthesia (Schirmer's test- 1) & (b) After anesthesia (Basal Secretion/SCH-2).

The Schirmer's test was performed after a thorough slit-lamp examination so that ocular irritation by the test strip would not interfere with other examination results. The material used was commercially available Whatmann no. 41 filter paper strips measuring 35x5 mm known as Schirmer's tear test filter strips & is folded 5mm from one end. The patient was made to sit in a dimly lit room, the strip folded at the notch was placed gently over the lower palpebral conjunctiva at the junction of lateral 1/3 & medial 2/3. The patient was instructed to keep his eyes open & look straight ahead & blink normally. After 5 minutes, the strips were removed & the amount of wetting in millimeters was recorded. The Schirmer's- 1 test (without anaesthesia) was considered positive if the length of the wetting was less than 10mm at the end of 5 minutes. The Schirmer's test after anesthesia (Basal secretion) was performed after the instillation of topical 4% xylocaine & wiping the lower fornix with cotton, in the same manner as the Schirmer's-1 test.

**Statistical analysis:** The data was analysed using statistical software MS Excel / SPSS version 17.0 for windows. Data presented as number/percentage (%) as discussed appropriate for quantitative & qualitative variables.

**Prevalence-Point prevalence** of a disease is defined as the number of all current cases (old and new) of a

disease at one point of time, in relation to a defined population. The "Point" in a point prevalence may for all practical purposes consist of a day, several days, or even a few weeks, depending on the time it takes to examine the population sample.

Number of all current cases (old and new) of a specified disease existing at a given point in time

$$\frac{\text{Number of all current cases (old and new) of a specified disease existing at a given point in time}}{\text{Estimated population at the same point in time.}} \times 100$$

Estimated population at the same point in time.

### Observation & Results

A disorder of tear film is tear instability, the tear film instability can lead to vision-threatening complications by causing dry eye syndrome & hence early diagnosis is important. Various aspects of the integrity of the tear film can be measured by clinical tests as Schirmer's test, tear film break up time (TBUT) and vital dye staining of the ocular surface.<sup>5</sup> During the study following observations were made.

In the present study, the most frequently occurring symptom was burning sensation 350(70%), followed by grittiness in 245(49%).(Table no 1)

The Schirmer-1 was positive in 230 whereas Schirmer-2 was positive in 189. Both Schirmer's 1&2 were positive in 189 women. The prevalence of dry eye in postmenopausal women in present study was 37.8%.(Table no 2&3)

### Discussion

UV rays in the sun cause more damaging effects to patients with decreased tear production. Decrease in the performance of activities of daily living i.e. an overall decrease in quality of life occurs in patients of dry eye disease.<sup>1</sup> The aim of our study was to find out the prevalence of dry eye in post-menopausal women visiting the hospital for refraction.

In the present study 189 out of 500 women had dry eye. This higher percentage in present study may be because of reason that large number of females in present study were from rural background, works in field, more exposure to UV rays etc & all these factors cause dry eye. Maximum Number of patients had mild dry eye & also the prevalence of dryness increases with increase in age group. Agarwal R et al in their study found that prevalence of dry in postmenopausal women were 32%. The prevalence of mild dry eye was maximum (21%) in their study.<sup>4</sup> Moss SE et al in their study found that the prevalence of dry eye was 14.4% in 3,722 subjects aged 48 to 91 years and noted that the prevalence of the condition doubled after the age of 59.<sup>7</sup> In another study of dry eye syndrome among US women showed that the prevalence of DES increased with age, from 5.7% among women < 50 years old to 9.8% among women aged  $\geq 75$  years old. The age-adjusted prevalence of DES was 7.8%, or 3.23 million women aged  $\geq 50$  in the US.<sup>7</sup> Lin P et al in a study of prevalence of dry eye among an elderly Chinese population in Taiwan found that women were more likely to report frequent symptoms of dry eye (odds ratio, 1.49; 95% confidence interval, 1.19–1.87). Among symptomatic, tear film tests were abnormal as a low tear film breakup time ( $\leq 10$  seconds) was found in 78.9% (362/459), a low Schirmer test result ( $\leq 5$  mm) was found in 62.5% (287/459) and abnormal anatomic features of the meibomian glands in 61.7% (283/459). Furthermore, 85.4% (392/459) were symptomatic and had either a low Schirmer score or an abnormal meibomian gland assessment.<sup>8</sup> Schaumberg DA et al in a study found that use of HRT was significantly related to the prevalence of dry eye syndrome. Considering the prevalence of either clinically diagnosed dry eye syndrome or severe symptoms,

women who never used HRT had the lowest prevalence (5.9%). Women who used estrogen alone had the highest prevalence (9.1%), and women who used a combination of estrogen plus progesterone/progestin had a prevalence that was intermediate between never users and users of estrogen alone (6.7%).<sup>7</sup> The mean corneal thickness value was significantly decreased in postmenopausal women with dry eye ( $P < 0.001$  at each corneal location). The central cornea had the thinnest mean values in dry eyes and normal eyes ( $533.10 \pm 4.74 \mu\text{m}$  and  $547.63 \pm 15.11 \mu\text{m}$ , respectively), whereas superonasal cornea had thicker mean values in both groups ( $632.43 \pm 6.11 \mu\text{m}$  and  $648.78 \pm 14.98 \mu\text{m}$  in dry eye and normal eyes, respectively).<sup>9</sup> In another dry eye epidemiology study, 13,517 subjects attending optometry clinics in Canada, aged 10-80yrs. Cross-sectional (clinic based) study was conducted. Prevalence was noted to be 28.7%.<sup>10</sup> In Melbourne visual impairment project: 926 subjects in Australia, 40-97 years old, cross sectional study, prevalence was recorded to be 7.4%. In another study on 3703 subjects from Beaver Dam, prevalence of dry eye was found to be 14.4% in a population based study.<sup>6</sup>

### Conclusion

From present study it has been concluded that there is high prevalence of dry eye in post-menopausal women i.e 37.8%. Thus, dry eye is a hidden disorder which affects significant number of female population in the post-menopausal age group. Therefore, every women should have a regular eye checkup after menopause so that dry eye as cause of visual impairment could be excluded. Dry eye tests should be performed in postmenopausal patients and appropriate tear substitutes should be prescribed based on these results.

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**Legend Figure**

Table 1: Frequency of symptoms among participants.

Symptoms	No. of cases	%age
Burning	350	70
Redness	223	44.6
Crusting	212	42.4
Grittiness	245	49
Other symptoms	200	40

Table :2 Schirmer's test result

Schirmer's test	Positive	Negative
Schirmer's test-1	230	270
Schirmer's test-2	189	311
Schirmer's test-1& 2	189	311

Table 3: Prevalence of dry eye.

Dry eye test positive	Total no. of patients	Prevalence
189	500	37.8%