

## Prevalence of severe dry eye disease in postmenopausal women in North India: A teaching hospital study

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### Abstract

**Aim:** To assess the prevalence and severity of dry eye disease (DED) in postmenopausal women in Northern India.

**Materials and Methods:** Sixty six (out of 90 enrolled) women of post-menopausal age with dry eye disease who were treated in a teaching hospital in Northern India, between March 2017 and April 2018, were analyzed prospectively to determine patterns of clinical presentation and treatment outcome. After noting the detailed history and demography, all patients underwent thorough ocular examination including assessment of visual acuity by Snellen's chart and anterior segment evaluation with slit lamp biomicroscopy. Dry eye evaluation was done with Schirmer's test and Tear film break-up time (TBUT).

**Result:** The overall prevalence of dry eye disease in post-menopausal women was 73.33% which was statistically significant ( $p < 0.001$ ). Maximum number of patients (53.03%) having dry eye disease had duration of menopause ranging from 6-10 years. 34.85% had tear film instability and 18.18% had aqueous deficient dry eye, however majority of patients had mixed type of DED. 24.24% patients had severe degree of DED. Severity of DED increases with increasing age of patient and duration of menopause.

**Conclusion:** Dry eye disease is a common problem in post-menopausal women which may lead to visual impairment / blindness. By early diagnosis and treatment of DED in post-menopausal women quality of life can be improved and severe dry eye related blindness can be reduced. Hence, ophthalmic evaluation for dry eye should be integral part of the post-menopausal women.

**Keywords:** Dry eye disease, Post-menopause, Schirmer's test, Tear film break-up time, Visual impairment.

### Introduction

Dry eye disease (DED) is a multifactorial disorders of the tear film and ocular surface due to tear deficiency or excessive tear evaporation causing damage to interpalpebral ocular surface and associated with symptoms of foreign body sensation, dryness, blurring of vision, photophobia and tear film/ instability.<sup>1,2</sup> The prevalence rate of DED ranging from 7% to 33%.<sup>3,4</sup> The prevalence is higher in Asian countries. Post-menopausal women are more commonly affected by dry eye disorders. In United States, about 3.23 million women are affected by dry eye disorders.<sup>5</sup> Sex hormone plays important role in maintenance of normal ocular surface integrity and Meibomian gland function. In case of post-menopausal syndrome, decrease sex hormone level result into inflammation of lacrimal gland and ocular surface disruption. This study was conducted to find out any association between type and severity of DED and menopause.

### Materials and Methods

This was a hospital based descriptive study where post-menopausal women were evaluated prospectively. The study was carried out at the Regional Institute of Ophthalmology and Department of Obstetrics and Gynecology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, U P, India from March 2017 and April 2018. The study strictly adhered to the tenets of declaration of Helsinki and was approved by the Institute Ethical committee. All women of post-menopausal age group having attained menopause for at least 1 year were included in the study. Patients with eyelid disorders, diabetes, thyroid eye disorders, rheumatoid

arthritis and other auto-immune diseases affecting ocular surface and contact lens wearers were excluded from the study. Patients undergoing any hormonal therapy were also excluded from the study.

A detailed history taking including systemic diseases, menstrual history and ocular complaints was done, followed by detailed ocular examination including visual acuity, slit lamp examination and biomicroscopy. Ophthalmoscopy was performed for each eye. Dry eye was evaluated by Rose Bengal test, Schirmer's test and tear film break up time. Data was compiled and demographic characteristics, presenting symptoms and signs. Statistical analyses was done by using SPSS version 19.0.

### Result

A total of 90 post-menopausal women were enrolled for this study, out of which 66 (73.33%) had DED. 40(44.44%) women belonged to rural background with outdoor activities. Majority of post-menopausal patients belonged to age group 55-59 years (27.78%) and 60- 64 years (23.33%). Only 12.12% post-menopausal patients belonged to 45-49 years age group (Table 1). Maximum number of patients (53.03%) having dry eye disease had duration of menopause ranging from 6-10 years. Minimum number of patients having dry eyes (7.58%) had duration of menopause ranging from 1- 5 years (Fig. 1). 34.85% had tear film instability and 18.18% had aqueous deficient dry eye, however majority of patients (46.97%) had mixed type of DED (Table 2). 24.24% patients had severe degree of DED (Table 3). Severity of DED increases with increasing age of patient and duration of

menopause. 9.10% patients had disabling dry eye disease such as symblepheron, corneal scarring/ vascularisation etc. (Table 3 and Fig. 2). Most common symptoms of DED were burning, grittiness sensation, dryness, scratching and redness. However 27.27% patients had DED related visual impairment.

**Table 1: Frequency of Dry eye in post-menopausal women**

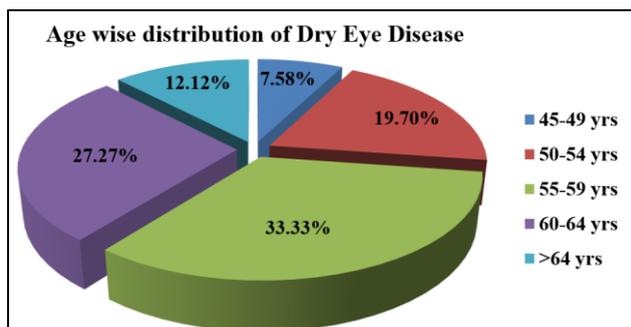
Age group (Years)	Post-menopausal women		Patients with Dry eye	
	No	%	No	%
45-49	11	12.22	5	45.45
50-54	19	21.11	13	68.42
55-59	25	27.78	22	88.00
60-64	21	23.33	18	85.71
>64	14	15.6	8	57.14
Total	90	100.00	66	73.33

**Table 2: Distribution according to types of dry eye disease**

Types of DED	No	%
Aqueous deficiency	12	18.18
Tear film instability	23	34.85
Mixed	31	46.97

**Table 3: Distribution according to severity of dry eye disease**

Severity of DED	No	%
Mild (Episodic)	18	27.27
Moderate (Chronic dry eye)	32	48.48
Severe Dry Eye	10	15.15
Most severe (disabling dry eye)	6	9.10



**Fig. 1: Age wise distribution of dry eye in post-menopausal women**



**Fig. 2: (A) Photograph of 60 years old female having severe dry eye disease in right eye and moderate degree of dry eye in left eye. (B) Showing marked meibomitis, conjunctival congestion and corneal ulceration**

## Discussion

Dry eye disease frequently causes debilitating ocular symptoms like burning, foreign body sensation, photophobia and visual impairment which affects the patient's general performance and quality of life. The reported prevalence of dry eye in general population varies from 10.8% - 57.1%.<sup>6</sup> Women are more prone for DED. United State report says rate of DED in post-menopausal women is nearly double that in men over 50 years age.<sup>5</sup> Winter JH et al found in their study of DED that, 80.4% of patients were females.<sup>3</sup> Prevalence of DED in post-menopausal women in our study was found to be 73.33%. High prevalence of DED in post-menopausal women was reported in studies from different part of India. In Delhi it has been recorded 27%, in West Bengal 51.9% and in Karnataka it has been recorded 60%.<sup>7-11</sup> In our study 31 patients (46.97%) had mixed type, 23 patients (34.85%) had tear film instability and 12 patients (18.18%) had aqueous deficient dry eye. Farrell et al reported tear film deficient dry eye in 14.7% of cases and mixed dry eye in 70.6%.<sup>12</sup> Winter

et al reported 21.6% cases of tear deficient dry eye and 45.3% cases of mixed dry eye.<sup>3,13</sup> Our findings support the above studies.

We found correlation between the presence of DED and post-menopausal women. Caterina Gagliano et al suggested that deficiency in estrogen sex hormone may lead to reduction in tear production (aqueous- deficient dry eye) and meibomian gland dysfunction (evaporative dry eye).<sup>14</sup> The drawback of our study is the lack of estimation of sex hormone levels which would prove the association of dry eye in elderly women.

## Conclusion

Dry eye disease is a common problem in postmenopausal women which may lead to visual impairment or blindness. High prevalence is due to hormonal changes, nutritional deficiency, environmental conditions, under diagnosis of condition and poor compliance of post menopausal patients. It is very difficult to treat advanced cases of DED. By early

diagnosis and treatment of DED in postmenopausal women quality of life can be improved and severe dry eye related blindness can be reduced. Hence, ophthalmic evaluation for dry eye should be an integral part of the examination of postmenopausal women.

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**Conflict of Interest:** None.

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