

## A study on prevalence of dry eye among postmenopausal women attending ophthalmology OPD

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**Abstract:** *Purpose:* Having insufficient lubrication and moisture on the surface of the eye causes dry eye syndrome. Burning, itchy, weary, red, gritty, and dry eyes are all signs of dry eye syndrome. There are other symptoms such as blurred vision and fatigued eyes. The study's goals and objectives were to find out how common dry eye syndrome is in post-menopausal women at a tertiary care facility in Vijayapura and to analyze sociodemographic characteristics that may be associated with the condition in the group under study. Aims and objectives were to determine the prevalence of dry eye syndrome among post-menopausal women at tertiary care center, Vijayapura and to assess the socio demographic factors related to dry eye syndrome among study population. *Method:* A cross sectional study was conducted from June 2021 to November 2021 among postmenopausal women attending ophthalmology OPD, 120 patients were evaluated. Patients data was recorded and OSDI scoring was done, visual acuity testing and anterior segment evaluation was done with slit lamp biomicroscopy. Dry eye evaluation was done with schirmers and TBUT testing was done. *Results:* Prevalence of dry eye among post menopausal women was 47.5%. The prevalence of dry eye was 75% in age group more than 70yrs and 25% in age group (50-55yrs). The schimers test showed majority 29.166% had mild dry eye, 18.33% had moderate dry eye. The prevalence of dry eye with outdoor occupation was 66.66% compared to indoor (33%). Prevalence of dry eye with symptoms was 87.5% and prevalence of dry eye without symptoms was 25%. *Conclusion:* There is high prevalence of dry eye in postmenopausal women. Patients without symptoms have subclinical dry eye. Patients with outdoor occupation have higher prevalence. It would be advisable to screen all postmenopausal women for dry eye using simple tests. Hence treatment should be initiated early. Schirmers test revealed most patients had mild to moderate dry eye.

**Keywords:** OSDI Scoring, Slit Lamp Biomicroscopy, Schirmers Test, TBUT test, Visual Acuity.

### Introduction

Dry eye disease (DED) is a multifactorial disease 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 [1-2]. The prevalence is higher in Asian countries. Post-menopausal women are more commonly affected by dry eye disorder. In United States, about 3.23 million women are affected by dry eye disorder [3]. Menopause is defined as a physiological cessation of the menstrual cycle. It plays an important role in the development of eye surface dryness symptoms due to modulation of hormones in the body [4]. In the development of

the dry eye, menopause can play an important role. The effect of hormones on the incidence and course of dry eye has been noted. The meibomian gland is an androgen target organ [5]. Androgens are known to regulate the development, differentiation, and lipid production of sebaceous glands throughout the body. They primarily act on acinar epithelial cells in sebaceous glands, and these cells contain both androgen receptor messenger RNA [6]. These regulate usually the quality and quantity of the produced lipid and promotes the formation of the lipid layer of the tear film.

*Purpose:* Having insufficient lubrication and moisture on the surface of the eye causes dry

eye syndrome. Burning, itchy, weary, red, gritty, and dry eyes are all signs of dry eye syndrome. There are other symptoms such as blurred vision and fatigued eyes. The study's goals and objectives were to find out how common dry eye syndrome is in post-menopausal women at a tertiary care facility in Vijayapura and to analyze sociodemographic characteristics that may be associated with the condition in the group under study.

**Aims:** The aim of the study is to evaluate hospital-based prevalence of dry eye in post-menopausal women, according to age, symptoms of dry eye and occupation.

**Material and Methods**

**Study Design:** This is a cross sectional study of post menopausal women attending ophthalmology OPD in Al Ameen Medical College & Hospital, Vijayapur

**Sample size:** a convenient sample of 120 postmenopausal women was taken.

**Inclusion Criteria:** All women who attained menopause.

**Exclusion Criteria:**

1. Pre existing ocular surface diseases like chemical burns, vernal kerato conjunctivitis, steven Johnson syndrome
2. Ocular surgery in the past 6 months like cataract, ptosis surgery, entropion/ ectropion surgery, blepharoplasty
3. Ocular infection within past 3 months like Herpes Zoster and Varicella Zoster
4. Chronic ocular allergy like allergic blepharo conjunctivitis
5. Topical medications antiglaucoma medications, vasoconstrictors, corticosteroids, antihistaminics
6. Systemic diseases like parkinsons, lupus, diabetics.

All the participants were subjected to history taking and Examination included visual acuity measurement with correction, external eye examination and slit lamp biomicroscopy. Every postmenopausal female presenting with or without symptoms suggestive of dry eye will be administered an OSDI (Ocular Surface Disease Index) questionnaire and were categorized.

An OSDI score 0-12 represents no dry eye,13-22 mild dry eye,23-32 moderate dry eye and OSDI more than 32 severe dry eye. Diagnosis and confirmation of dry eye was done by series of tests performed in a standard sequence with a difference of at least 10 minutes as follows schirmers test, Tear film break up time(TBUT) test. Schirmers 1 test: A pre-calibrated dry filter paper was placed in lower fornix at junction of outer and middle third without touching cornea.

After 5 minutes strips were removed and amount of wetting in mm was recorded. TBUT test was performed by moistening a fluorescein strip with sterile non preserved saline and applying it to the inferior tarsal conjunctiva. The tear film was examined using a broad beam of slit lamp with cobalt blue filter. The elapse between last blink and appearance of first randomly distributed dark discontinuity in fluorescein stained tear film was a TBUT test. The result is considered positive if value was less than 10 seconds.

**Results**

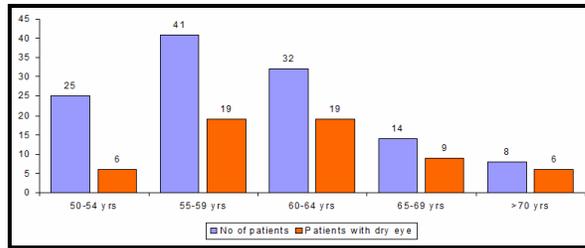
A total of 120 post menopausal women took part in the study out of which 57 had dry eye. The prevalence of dry eye in this study was 47.5% (Table-1).

Total number of Patients	120
Number of patients with Dry Eye	57

It was noted that prevalence of dry eye increases with age from 25% (50-54yrs), 46.3% (55-59yrs), 59.3% (60-64yrs), 64.8% (65-69yrs) to 75% (>70yrs) (Table-2& Fig-1).

Age group	No of patients	Patients with dry eye
50-54	25	6(25%)
55-59	41	19(46.3%)
60-64	32	19(59.3%)
65-69	14	9(64.8%)
>70	8	6(75%)

**Fig-1:** Age distribution of dry eyes



The prevalence of dry eye in patients with symptoms of dry eye was 68.75% and in patients without symptoms of dry eye was 5%. It was noted that 10 patients who did not have any symptoms of dry eye had subclinical dry eye which was detected using schirmers test (Tab-3).

	With symptoms	Without symptoms
No. of patients	80	40
Patients with dry eye	55 (68.75%)	2(5%)

Out of 57 patients with dry eye, 20.8% had mild, 18.3% had moderate and 4.1% had severe dry eye (table-4).

Schirmers test	Grade	No of patients	Percentage
9-14mm	Mild	25	20.8%
5-8mm	Moderate	22	18.3%
<5mm	Severe	5	4.1%

Prevalence of dry eye was common among patients with outdoor occupation due to exposure to dust, sunlight and pollution (table-5).

Occupation	Normal	Dry eye	Total
Outdoor	12	38(66.6%)	50
Indoor	51	19 (33%)	70

**Discussion**

Dry eye disease frequently causes ocular irritation. With symptoms overlapping with other diseases, it is often an undetected condition causing prolonged morbidity. A crucial factor in

dry eye is the loss of tear film stability which leads to tear film hyperosmolarity. Hyperosmolarity results in symptoms of ocular discomfort, dryness, foreign body sensation, grittiness, photophobia and blurred vision.

There is an age related decrease in Meibomian gland secretion possibly due to atrophy of acinar cells as well as alteration in quality of Meibomian gland secretions. The lacrimal gland also appears to undergo age related changes leading to decrease in aqueous production. Dry eye has been found to disproportionately affect women [7]. The higher prevalence of dry eye in women is attributed to levels of sex steroids and hormonal changes following menopause, differences in metabolism, lifestyle, response to diagnostic and therapeutic interventions as well as differences in immunity [3].

Low androgen levels are consistently associated with dry eye. The levels of 17 beta oestradiol, oestrone and testosterone in severe dry eye show inverse correlation with tear film osmolarity. In the present study, the prevalence of dry eye in postmenopausal women was 47.5%. A Similar study by Rajendra P Maurya et al studied 66 postmenopausal women found hospital based prevalence of dry eye in postmenopausal women to be 73.3% [8]. Gokul Kumar et al found prevalence of dry eye in tertiary care centre to be 39.5%, majority of patients having mild dry eye. The majority of patients in this study were seen in the age group 55-59yrs [9].

It was noted that prevalence of dry eye increases with age from (25%) in 50-54yrs to 75% more than 70yrs. Dr Pallavi Sharma et al in her study has shown the majority of women with dry eye belonged to age 61-65yrs [10]. Pujari et al found dry eye to be more common in 65-75yrs [11]. The prevalence of dry eye with symptoms was 68.75% and in patients without symptoms prevalence of dry eye was 5%. Therefore even patients without symptoms of dry eye can have subclinical dry eye which can easily be diagnosed with schirmers test. The schirmers test showed majority of patients in this study had mild dry

eye (20.8%) followed by moderate dry eye in (18.33%) and severe dry eye was seen in (4.1%) of the patients. 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 [12].

Gokul Kumar et al found that, majority of patients have mild dry eye [9]. Prevalence of dry eye among patients with outdoor occupation was (66.66%) compared to (33%) to indoor occupation patients. Patients with outdoor occupation had a higher prevalence of dry eye probably due to air pollution, low humidity, high temperature and sunlight exposure. Dr Pallavi Sharma et al in her study has shown the majority of women who were farmer or labourer had highest percentage [10].

Mohana Majumdar et al studied 293 post menopausal women and found common ocular findings were foreign body sensation, grittiness, hyperemia, mucoid discharge and blurry vision [13]. Pujari et al found dry eye to be more common in 65-75yrs age group and more common in rural population [11] A study done by Caterina Gagliano et al suggests that deficiency in sexual hormones may not only cause a reduction in tear production leading to aqueous deficient dry eye but also a dysfunction in Meibomian gland function causing evaporative dry eye [14].

Early detection of dry eye is important to prevent complications. Environmental and behavioural modifications such as taking breaks while reading, keeping the computer monitors at eye level, use of UV protective glasses and humidification of the environment can be tried. Tear film substitutes such as hydroxy propyl methyl cellulose, carboxy methyl cellulose, polyvinyl alcohol, chondroitin sulphate and sodium hyaluronate are mainstay of dry eye management [15]. Anti inflammatory therapy such as cyclosporine eye drops and low dose corticosteroids such as loteprednol etabonate eye drops are considered to interrupt inflammatory cascade. Systemic Omega-3 fatty acids are also used. Severe dry eye needs surgical management like punctal occlusion with silicone plugs [4].

Hormonal replacement therapy (HRT) has proven both beneficial and harmful to postmenopausal women depending on the specific hormones used

and the organ system being studied. This is the case in dry eye as well. It is debated whether HRT increases, decreases, or does not affect risk of dry eye. Schaumberg *et al.* found that estrogen plus progesterone HRT significantly increased the risk over no HRT with an odds ratio of 1.29 [5].

Although the exact relationship between HRT and dry eye remains debatable, switching from an estrogen containing therapy, or stopping HRT altogether, if patients experience dry eye symptoms could allow for significant symptom improvement. The effects of estrogen plus progesterone therapy are less clear, but the most recent and largest controlled study (Examining the relationship between hormone therapy and dry-eye syndrome in postmenopausal women: a cross-sectional comparison). Showed a dose-dependent increased risk of dry eye symptoms in women taking estrogen and estrogen plus progesterone HRT. The authors of this study suggest that the reason for the discrepancy in results is that the studies finding beneficial effects of HRT were more prone to selection bias and subjectivity as they relied on patient's reports of symptoms and numerous caregivers were used [16].

Androgens are widely considered to be beneficial in dry eye and can provide some symptomatic improvement if included in systemic treatment. This appears especially true in women with abnormally low testosterone levels, men on androgen blockers, and patients with complete androgen insensitivity syndrome [5].

*Limitations:* The findings of this study cannot be generalized to whole community as it is a hospital based study and the sample size was less.

## Conclusion

The prevalence of dry eye in postmenopausal women in this study was 47.5%. The prevalence of dry eye increases with age from 25% in 50-54yrs to 75% >70yrs. The prevalence of dry eye in patients with symptoms was 87.5% and 25% in patients without symptoms. In Schirmers showed majority had mild dry eye followed by

moderate dry eye. Simple treatment with artificial tear substitutes can effectively manage mild and moderate dry eye and help postmenopausal women in improving their quality of life. Dry eye syndrome can negatively affect a woman's quality of life and overall eye health and women in the menopausal period and beyond may be at greater risk.

Dry eye can be present without any associated symptoms and so may be left undiagnosed for

years. It occurs in post-menopausal women. Age is a risk factor for dry eye disease. Mild dry eye disease is more common than the severe variety. Regular eye examination should be done after menopause. Tear film substitutes are the mainstay of treating dry eye disease. Omega 3 fatty acids also help in non responding cases. Cyclosporine, which is an immunomodulator and low dose steroids can be tried to break the inflammatory cycle.

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