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Authors and Affiliation:

Irum Riaz¹, Muhammad Anwar Awan²,
ZohraMunir³, Zaryab Khan⁴, Muhammad Aleem
Sabir Khan⁵, Mehronisa⁶

¹⁻⁶ Superior University , Lahore, Pakistan

*Corresponding Author Email:

irum.riaz@superior.edu.pk

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Assessment Of Dry Eye In Post-Menopausal Women

Irum Riaz¹, Muhammad Anwar Awan², Zohra Munir³,
Zaryab Khan⁴, Muhammad Aleem Sabir Khan⁵, Mehronisa⁶

¹⁻⁶ Superior University, Lahore, Pakistan

*Corresponding Author Email: irum.riaz@superior.edu.pk

ABSTRACT

Objective: *To find out the prevalence and severity of dry eye in Post-Menopausal Women.*

Methods: *The study included 59 participants who had been diagnosed with menopause based on their medical history. After acquiring signed consent, Patients were inquired about any ocular complaints of dry eye and a Schirmer test was done using an anesthetic agent after they were comfortable. The ethics committee had already given their approval.*

Results: *The current study included 59 post-menopausal women. The overall incidence of dry eye disease in postmenopausal women was found to be 43 (72.9%), which was statistically significant ($p < 0.05$). The majority of postmenopausal women with dry eyes were between the ages of 60–64 years old (83.3%). Among 43 (72.9%) postmenopausal women, 23.6% had mild dry eye, 51.16% had moderate dry eye, and 25.58% had a severe dry eye. DED becomes more severe as the patient becomes older and the menopause lasts longer. Hormonal changes, dietary deficiencies, environmental variables, under diagnoses of illness, and poor compliance were the most common causes of postmenopausal women's dry eyes.*

Conclusion: *Our study was compared to previous dry eye investigations, and the results were similar. Hence, dry eye should be tested and treated periodically. Early diagnosis of dry eye can reduce the risk of visual impairment and can improve the general performance of postmenopausal women.*

Keywords: *Dry Eye, Post-Menopausal Women, Schirmer Test.*

1. INTRODUCTION

Dry eye is a multifactorial ocular surface and tear film disorder caused by excessive tear evaporation and lack of tears leading to damage to the interpalpebral ocular surface and accompanied by typical symptoms such as dryness, blurring of vision, foreign body sensation, tear film/instability, as well as photophobia.¹ DED has a predominance rate ranging from 7% to 33%.²

Post Menopause, defined as a period of 12 months without a menstrual period, was linked to an increased risk of coronary heart disease and stroke.³ Dry eye diseases are more prevalent in postmenopausal women. Almost 50% of postmenopausal women experience genitourinary syndrome, which includes abnormalities in the bladder, vulva, and vagina. Vaginal dryness, burning, discomfort, loss of lubrication, dyspareunia (difficult sex), urine urgency and frequency, dysuria, and recurrent urinary tract infections are all symptoms to look out for.⁴ Under diagnosis and under treatment have a negative impact on relationships and quality of life.⁵

Hormones, gender, and sex significantly influence dry eye disease and ocular surface modification.⁶ Sex hormones affect both the functionality of the Meibomian gland and the structural integrity of the surface of the eye. Decreased sex hormone levels induce inflammation of the lachrymal gland and visual abnormalities in postmenopausal syndrome.⁷ In humans, androgens are observed to affect tear production and the ocular surface positively.⁸ However, the significance of estrogen is unclear,⁹ and the literature is divided on its effect on the ocular health and tear film.¹⁰ Osteoporosis, cardiovascular disease, and cognitive decline become more likely as women age and estrogen levels drop. Only 25% of menopausal women seek care for hot flashes as well as night sweats (vasomotor

symptoms), which are relatively brief sensations of heat, perspiration, flushing, anxiety, or chills lasting 1 to 5 minutes. The thermoregulatory zone narrows as estrogen levels fall, resulting in hot flashes in symptomatic women.¹¹ Early or surgical menopause, being black or Hispanic, having a high BMI or leading an unhealthy lifestyle, partner violence, sexual assault smoking, posttraumatic stress disorder, depression, anxiety and stress assault,¹² aromatase inhibitors and using selective estrogen receptor modulators are all risk factors for hot flashes.¹³ Treatments for dry eye syndrome are generally costly and ineffectual, leaving many patients without symptom relief.¹⁴

DED is more common in postmenopausal women. Thus, according to large-scale prospective studies conducted in the US, the rate of DED in women over 50 is nearly double that of men over 50, at 7% and 4%, respectively.¹⁵ Various investigations have revealed that this group's sensitivity to DED is due to hormonal etiology.¹⁶ Tear generation and function have been shown to be affected by androgens.¹⁷

Signs and symptoms of dry eyes may not always match up, which could be because of how people feel pain and how sensitive they are.¹⁸ Gender often affects pain perception in both systemic pain and dry eye disease (DED).¹⁹ Dry eye issues have been associated with heightened pain threshold sensitivity and poorer pain tolerance, as evidenced by heat stimulation applied to the arm.²⁰ This indicates that individuals with symptomatic dry eyes are more prone to experiencing pain and vice versa.¹⁴

2. METHODOLOGY

A cross-sectional study was conducted from Feb 2022 to June 2022 at Zahra Clinic Lahore. The sample size of 59 participants was calculated with a 95% confidence interval and a 5% margin of error. The Sample size was calculated by the following formula:

$$n = \frac{Z^2 * P(1 - P)}{d^2}$$

The collected data were input into statistical software, SPSS (Version 22). Based on the characteristics of the variables, suitable descriptive statistics were utilized. Cross tables were generated for the acquired data. The Chi-square test was employed to assess the association. A significance level of ($P < 0.05$) was established. The Superior University, Lahore Ethics Committee provided the ethical approval of the study with Ref: IRB/FAHS/Optomtry/12/10/2021/A-1344.

3. RESULTS

Among 59 postmenopausal women, 43 (72.9%) were diagnosed with dry eye. It was found that the majority of post-menopausal patients were between the ages of 50 and 54 (22.0%) and between the ages of 55 and 59 (28.8%). Only (13.06%) of post-menopausal patients were > 64 years of age. Moreover, in > 64 years of age, 100% (08 out of 08) were diagnosed with dry eye, while in the 45-49 age group only 44.4% (04 out of 09) post-menopausal women were diagnosed with dry eye. Hence, a significant association was found between post-menopausal age and the frequency of dry eye among postmenopausal women ($P = 0.03$).

Table 1: Association Between Post Menopausal Age & Frequency of Dry Eye

Age Groups	Post-Menopausal Women		Patients with Dry Eye		P-value
	Frequency	Percentage	Frequency	Percentage	
45-49	9	15.3%	4	44.4%	.033
50-54	13	22.0%	7	53.8%	
55-59	17	28.8%	14	82.4%	
60-64	12	20.3%	10	83.3%	
> 64	8	13.6%	8	100.0%	
Total	59	100.0%	43	72.9%	

Table 2: Association Between Menopausal Duration & Severity of Dry Eye

Duration of Menopause	Severity of Dry Eye				P-value
	Mild (10-15 mm) n (%)	Moderate (5-10 mm) n (%)	Severe (0-5 mm) n (%)	Total n (%)	
1-3 Years	2 (66.7%)	1 (33.3%)	0 (0.0%)	3 (100.0%)	.001
4-6 Years	5 (62.5%)	3 (37.5%)	0 (0.0%)	8 (100.0%)	
7-9 Years	3 (21.4%)	9 (64.3%)	2 (14.3%)	14 (100.0%)	
10-12 Years	0 (0.0%)	7 (70.0%)	3 (30.0%)	10 (100.0%)	
> 12 Years	0 (0.0%)	2 (25.0%)	6 (75.0%)	8 (100.0%)	
Total	10 (23.3%)	22 (51.2%)	11 (25.6%)	43 (100.0%)	

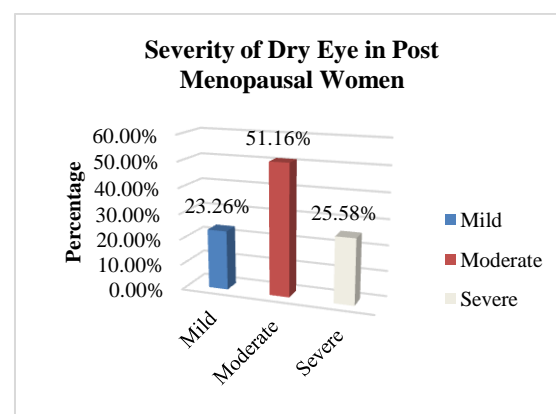


Figure: 1 Severity of Dry Eye

Two women (66.7%) experienced mild dry eye and one (33.33%) had significant dry eye after 1-3 years of menopause. From 4-6 years, 5 (62.5%) had mild, 3 (37.5%) moderate, and none severe dry eye. From 7-9 years, 3 (21.4%) had mild, 9 (64.3%) moderate, and 2 (14.3%) severe dry eye. From 10-12 years, 7 (70.0%) had moderate dry eye and 3 (30.0%) severe. Among women with menopausal duration > 12 years, none had

mild dry eye, 2 (25.0%) had moderate, and 6 (75.0%) had severe. Thus, menopause duration was associated with dry eye severity in post-menopausal women ($P=0.001$).

Among 59 postmenopausal women, 43 (72.9%) had dry eye, of which 10 (23.6%) had mild dry eye, 22 (51.16%) had moderate dry eye and 11 (25.58%) had severe dry eye.

4. DISCUSSION

A lack of tears or increased tear evaporation damages the interpalpebral ocular surface, causing symptoms such as tear film instability, photophobia, blurring of vision, foreign body sensation and dryness.⁷ Due to the high frequency, hormonal changes, nutritional deficiencies, environmental factors, under diagnosis of disease, and poor compliance of postmenopausal patients, dry eye is a common problem. According to a few big epidemiological studies increased incidence of dry eye has been discovered among the elderly, particularly those over the age of 50.²¹

The present study assessed the prevalence and severity of DED in postmenopausal women. In our study, dry eye was shown to be prevalent in 72.9% of postmenopausal women who visits the OPD on a regular basis. These findings are similar to those of a previous study conducted by Rajendra P Maurya et al. in India in 2019. In that study, the overall predominance of DED in postmenopausal women was 73.33%.⁷ These figures could be high in both studies because patients may not feel the symptoms. Furthermore, as to the component of the severity of DED among postmenopausal women, the current study found that 14.3% were suffering from severe dry eye, which is analogous to the aforementioned study done by Rajendra P Maurya et al., which found that 15.5 percent of postmenopausal women had a severe dry eye.

Another study conducted by Majumdar M in 2014 at a Tertiary Hospital in Gujarat, India, discovered that in the early stages of menopause, 35% of females suffered from dry eye, while the majority (60.60%) suffered from dry eye between the ages of 60-65 Years.²² The results of this study are comparable to the current study. In the current study, 44.4% of women had dry eye disease in the early stages of menopause, however, the severity of the dryness was mild (66.7%) in these women. Moreover, the frequency of dry eye among postmenopausal women increased up to 55.6% as the age and duration of menopause increased. The current study also discovered that the least frequency of women experiencing dry eye had a menopause duration of 1-3 years, while the maximum frequency of patients experiencing dry eye had a menopause duration of > 12 years. The reason for this could be that, as a woman enters menopause, the lachrymal and meibomian glands in her eyelids are affected by a decline in androgen levels. The essential oils for tears are produced by the meibomian glands, thus when there is less oil present, tears evaporate more quickly and eyes become drier.

In a prior cross-sectional study conducted in 2018 by Ziemanski JF et al., severe dry eye was more common in women aged 60 to 64 years old. According to the findings of that study, about 66.6% of this age group of women had a severe dry eye.²³ In the current study, however, only 30.0% of the aforementioned age group women had a severe dry eye. The reason for this could be the circumstances, which might not be the same in both studies. Our study had one flaw: it did not assess sex hormone levels, which would have confirmed the link between dry eye and age.

5. CONCLUSION

Dry eye is a prevalent condition in postmenopausal women, causing

debilitating ocular symptoms such as vision impairment, photophobia, burning, and foreign body sensation, all of which have an impact on the patient's overall performance and quality of life. Early detection of DED in women can lead to a substantial improvement in their QOL as well as a lower chance of blindness due to the severity of dry eye.

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