



## Proportion of Dry Eye Disease And it's Impact on Quality of Life among Postmenopausal Women Attending Ophthalmology Outpatient Department of Tertiary Care Center in Alappuzha

Dr. Alisha. P.Shaju<sup>1\*</sup>; Dr. Mallika. O.U<sup>2</sup>; Dr. Dhanya. R.S<sup>3</sup>; Dr. Dalia. S<sup>4</sup>

<sup>1</sup> PG Resident, Department of Ophthalmology, Government TD Medical College Alappuzha

<sup>2</sup> Professor and HOD, Department of Ophthalmology, Government TD Medical college Alappuzha.

<sup>3</sup> Assistant Professor, Department of Ophthalmology, Government TD Medical college Alappuzha.

<sup>4</sup> Associate Professor, Department of Ophthalmology, Government TD Medical college Alappuzha.

### ABSTRACT

**Purpose:** To find the proportion of dry eye disease and it's impact on quality of life among postmenopausal women attending ophthalmology outpatient department of tertiary care center in Alappuzha. **Materials and methods:** In this study, 98 post menopausal women as per inclusion and exclusion criteria were asked to fill OSDI questionnaire composed of 12 items referring to activities in the week prior to completion. Three subscales in it include ocular symptoms, vision related functions and environmental triggers. Each item of the OSDI questionnaire was graded on a score of 0-4.0-indicates none of the time, 1- some of the time, 2 - half of the time, 3 - most of the time, 4- all the time. This score is assessed on a scale of 0-100 Higher scores represents higher disability and symptoms **Results:** Mean age was found to be 63.2 years with a standard deviation of 6.9 and mean age of menopause was 49.9 years with a standard deviation of 1.3. Proportion of dry eye based on Schirmer test was found to be 67.3%, by TBUT test was 68.4% and by Oxford grading 68.4%. By oxford grading proportion of postmenopausal women with minimal dry eye was 60.2% and with mild dry eye was 8.2%. By OSDI score, 92.4% postmenopausal women with dry eye by Schirmer test were severely affected by dry eye, 89.6% of them with dry eye by TBUT were severely affected. Among persons without dry eye by Schirmer test, 56.3% had normal quality of life, 34.4% had mild to moderate deterioration in quality of life and 9.4% had severe deterioration in quality of life. By TBUT test 58.1% of those without dry eye had normal quality of life, 29% had mild to moderate deterioration in quality of life and 12.9% had severe deterioration in quality of life. By Oxford grading, among persons without dry eye, 58.1% had normal quality of life, 29% had mild to moderate deterioration in quality of life and 12.9 % had severe deterioration in quality of life. 78.57% had gritty eyes, 77.55% had blurred vision, 75.51% had painful eyes, 68.36% had poor vision and 47.95% had sensitivity to light. 70.2% of study participants with postmenopausal period more than 10 years has severe deterioration in quality of life compared to 58.5% in those with postmenopausal period less than or equal to 10 years. **Conclusion:** Proportion of dry eye was found to be high in postmenopausal women and leads to severe deterioration of their quality of life. Alteration of sex hormones lead to abnormal tear film, which in turn leads to increased symptoms of dry eye. So there is a need to identify dry eye disease in postmenopausal women to maintain ocular surface health and regular ophthalmologic evaluation need to be done.

**Key Words:** OSDI; Eye Disease; Postmenopausal; Ophthalmology



\*Corresponding Author

Dr. Alisha. P.Shaju

PG Resident, Department of Ophthalmology, Government TD Medical College Alappuzha

### INTRODUCTION

Dry eye is problematic in elderly women (1). A moist film over ocular surface is necessary for normal function of eye and visual system. Components essential for a complete tear film are adequate and continuous tear production and appropriate elimination of tears through evaporation, absorption and drainage. (2) For screening and diagnosing dry eye disease, the international dry eye workshop recommends several tests including symptom questionnaires, grading ocular surface staining, tear break up time (TBUT), measuring tear osmolarity, Schirmer test (1).

### AIM OF STUDY

To find the proportion of dry eye disease and it's impact on quality of life among postmenopausal women attending ophthalmology outpatient department of tertiary care center in Alappuzha.

## **MATERIAL AND METHODS**

**Study design:** Hospital based cross sectional study.

**Study setting:** Ophthalmology outpatient department of a tertiary care center in Alappuzha

### **STUDY POPULATION**

Postmenopausal women attending OPD of ophthalmology department in a tertiary care center in Alappuzha

#### **Inclusion criteria:**

- Menopausal status by permanent menstrual cessation by at least 12 months.
- Postmenopausal women of 51 to 80 years, attending to ophthalmology OPD of Government TDMC Alappuzha are included in this study with dry eye features like: Burning sensation, foreign body sensation, photophobia, blurred vision, Itching, ocular fatigue, sticky tears, watery eyes

#### **Exclusion criteria:**

History of autoimmune diseases, history of laser treatment (LASIK), history of contact lens use, using systemic beta-blockers, antidepressants, anxiolytics, antihistamines, steroids, long term use of topical medications, topical anti glaucoma medications, hormonal replacement therapy at present and during past one year, undergone hysterectomy, suspected carcinoma breast, carcinoma endometrium, hormone dependent neoplasia, history of ocular trauma, history of ocular surgery, diabetes, asthma, patients not willing to participate in the study.

### **SAMPLE SIZE**

Sample size estimated is 98.

### **SAMPLING METHOD**

Non probability sampling, consecutive sampling method is used for this study

### **STUDY VARIABLES**

Name, age, age at menopause, total OSDI score, severity of dry eye by total OSDI score, Schirmer1 test value(average value of two eyes), oxford grade, TBUT test value(average value of two eyes), duration of postmenopausal period. Total OSDI score- Normal (scores 0-12), mild dry eye disease (scores 13-22), moderate dry eye disease (scores 23-32), severe dry eye disease (scores 33-100). Category of dry eye disease- mild, moderate, severe. Schirmer 1 test value- Less than 10 mm wetting after 5 minutes is abnormal. TBUT test grade- less than 10 seconds suspicious of dry eye disease. Quality of life measured by vision related function and subscale of OSDI questionnaire.

### **DATA COLLECTION TOOLS**

Schirmer strips, fluorescein strips, rose bengal stain, OSDI questionnaire (Malayalam), slit lamp microscopy, proforma.

### **DATA COLLECTION PROCEDURE**

In this study, 98 post menopausal women as per inclusion and exclusion criteria were asked to fill OSDI questionnaire. The questionnaire was composed of 12 items referring to activities in the week prior to completion. Three subscales include ocular symptoms (Eyes that are sensitive to light, gritty eyes, painful eyes) vision related functions (blurred vision, poor vision, reading, driving at night, working with computer or bank ATM, watching TV) and environmental triggers (windy conditions, places or areas with low humidity, air conditioned areas) . Each item of the OSDI questionnaire was graded on a score of 0-4.0- indicates none of the time, 1- some of the time, 2 - half of the time, 3 - most of the time, 4- all the time.

This score is assessed on a scale of 0-100, obtained by multiplying total score of all questions by 25 and dividing the result by number of valid answers. Higher scores represents higher disability and symptoms. Maximum score of 100 points obtained per subscale.

### **SCORE**

- 0-12 Normal
- 13-22 Mild dry eye
- 23-32 Moderate dry eye
- 33-100 Severe dry eye

### **RESULTS:**

**Percentage distribution of sample according to age:**

Table 1 Percentage distribution of sample according to age

Age (in years)	Count	Percentage
51–60	43	43.9
61–70	36	36.7
71–80	19	19.4
Mean±SD		63.2±6.9

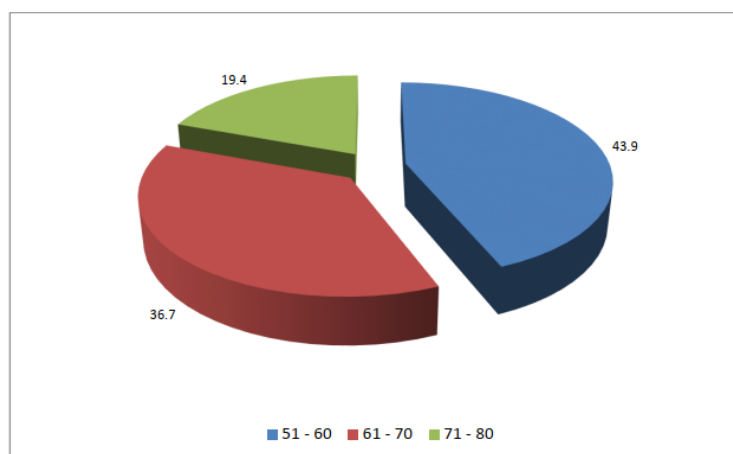


Figure 1: Percentage distribution of sample according to age

**Percentage distribution of sample according to age of menopause:**

Table 2 Percentage distribution of sample according to age of menopause

Age of menopause (in years)	Count	Percentage
46–50	81	82.7
51–55	17	17.3
Mean±SD		49.9±1.3

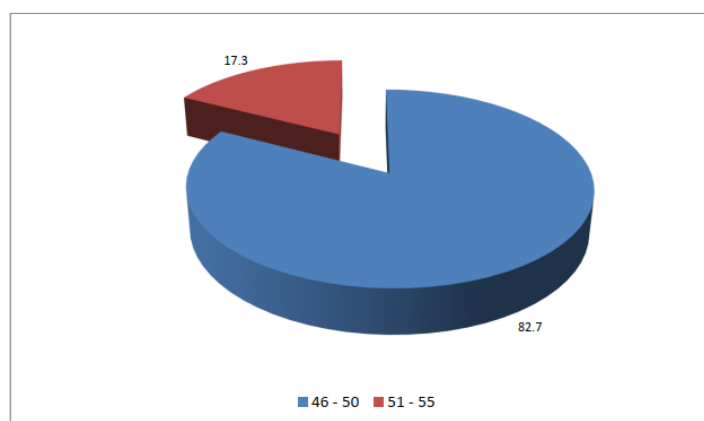


Figure 2: Percentage distribution of sample according to age of menopause

**Percentage distribution of sample according to post menopausal period:**

Table 3: Percentage distribution of sample according to post menopausal period

Post menopausal period(in years)	Count	Percentage
≤10	41	41.8
11– 20	36	36.7
>20	21	21.4
Mean±SD		13.4±7

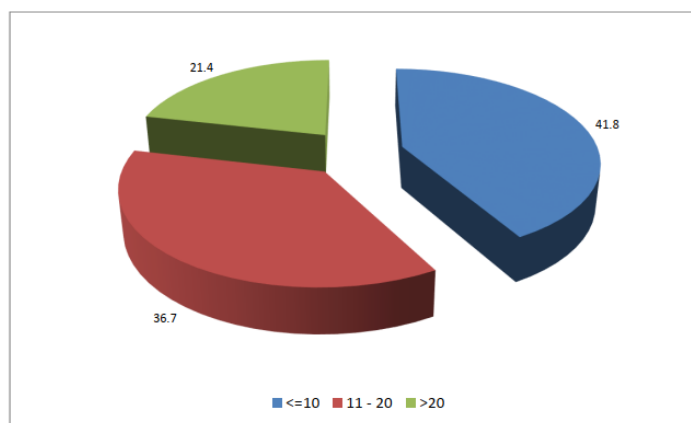


Figure3:Percentage distribution of sample according to post menopausal period

**Proportion of dry eye disease as per Schirmer test:**

Table 4: Percentage of sample with dry eye by Schirmer test

Schirmer criteria	Count	Percentage
Normal	32	32.7
Dryeye	66	67.3

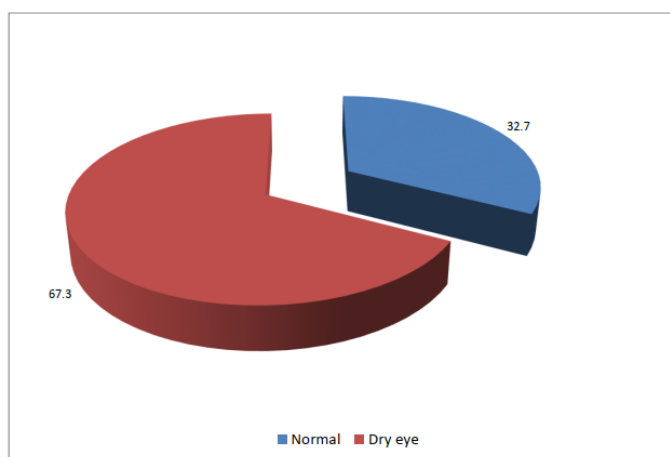


Figure 4: Percentage of sample with dry eye by Schirmer test

**Proportion of dry eye by TBUT test:**

Table 5: Percentage of sample with dry eye by TBUT test

TBUT criteria	Count	Percentage
Normal	31	31.6
Dryeye	67	68.4

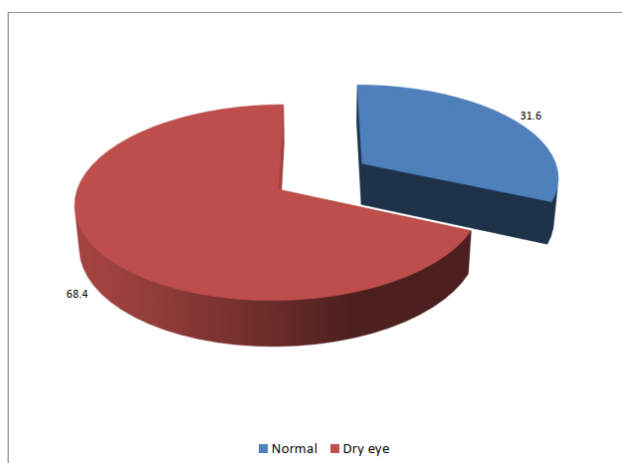


Figure5:Percentage of sample with dry eye by TBUT test

**Proportion of dry eye disease as per Oxford grade:**

Table 6: Percentage of sample with dry eye by Oxford grade

Oxford grade	Count	Percentage
Normal	31	31.6
Dryeye	67	68.4

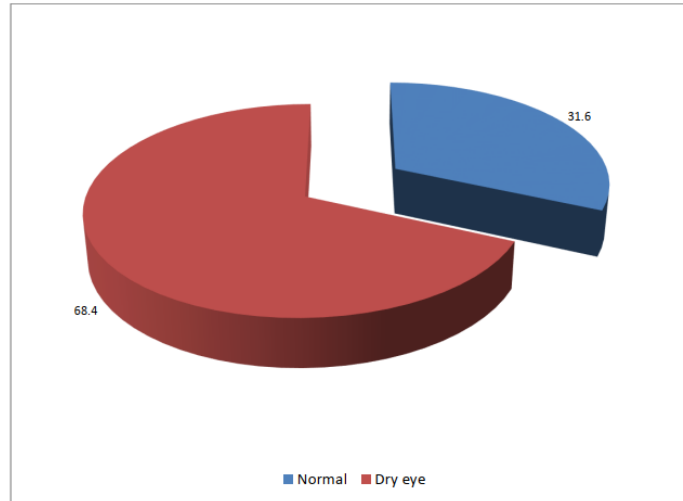


Figure 6: Percentage of sample with dry eye by Oxford grade

**Percentage distribution of dry eye categories by oxford grade:**

Table 7: Percentage distribution of dry eye categories by oxford grade

Oxford grade	Count	Percentage
Normal	31	31.6
Minimal	59	60.2
Mild	8	8.2

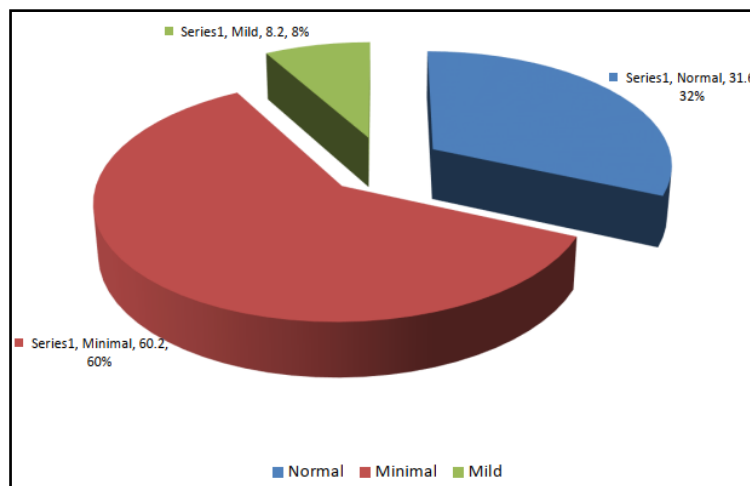
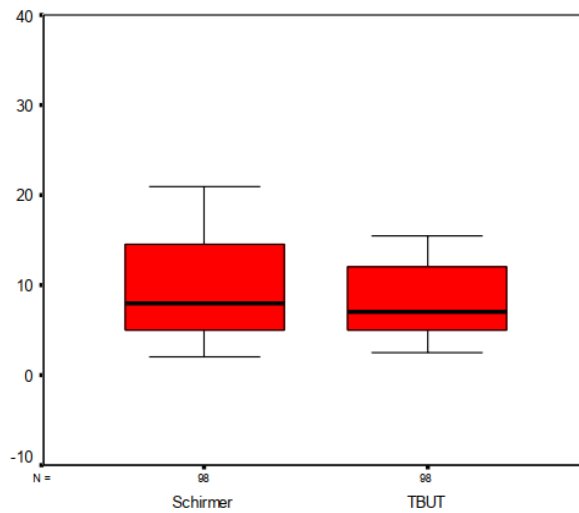


Figure 7: Percentage distribution of dry eye categories by oxford grade

**Descriptive statistics regarding TBUT and Schirmer score:**

Table 8: Descriptive statistics regarding Schirmer score and TBUT score

	Schirmer score(in mm)	TBUT score (in seconds)
Mean±SD	11.4±9.2	8±3.8
Median	8	7
Interquartilerange	5-14.63	4.88-12
Minimum	2.0	2.5
Maximum	35.0	15.5

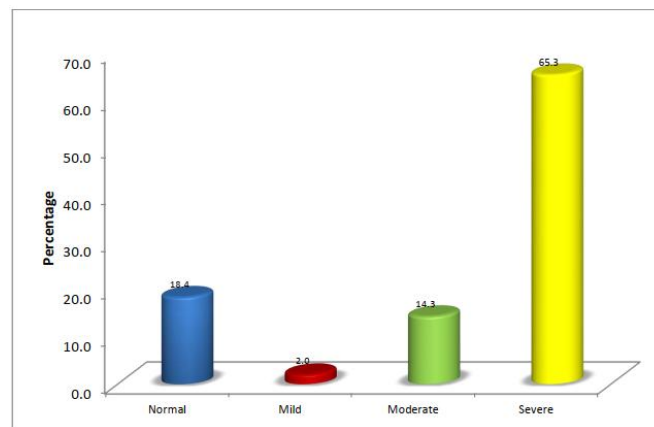


**Figure 8: Box plot for Schirmer score and TBUT score**

**Quality of life among postmenopausal women using OSDI questionnaire:**

Table 9: Percentage distribution of sample according to quality of life

Quality of life(using OSDI score)	Count	Percentage
Normal	18	18.4
Mild	2	2.0
Moderate	14	14.3
Severe	64	65.3



**Figure 9: Percentage distribution of sample according to quality of life**

**Descriptive statistics regarding quality of life:**

Table 10: Descriptive statistics regarding quality of life

<b>Mean±SD</b>	<b>51±28.5</b>
Median	57.74
Interquartile range	27.34-70.56
Minimum	0.0
Maximum	100.0

**Distribution of symptoms:**

Table 11: Percentage distribution of presenting symptoms

SYMPTOMS	COUNT	PERCENTAGE
Sensitivity to light	47	47.95
Gritty eyes	77	78.57
Painful eyes	74	75.51
Blurred vision	76	77.55
Poor vision	67	68.36

**Association of dry eye and quality of life:**

Table 12: Association of dry eye and quality of life:

		Normal		Mild/Moderate		Severe		$\chi^2$	P
		Count	Percentage	Count	Percentage	Count	Percentage		
Schirmer	Normal	18	56.3	11	34.4	3	9.4	69.37	p<0.01
	Dry eye	0	0.0	5	7.6	61	92.4		
TBUT	Normal	18	58.1	9	29.0	4	12.9	62.45	p<0.01
	Dry eye	0	0.0	7	10.4	60	89.6		
Oxford grade	Normal	18	58.1	9	29.0	4	12.9	62.45	p<0.01
	Dry eye	0	0.0	7	10.4	60	89.6		

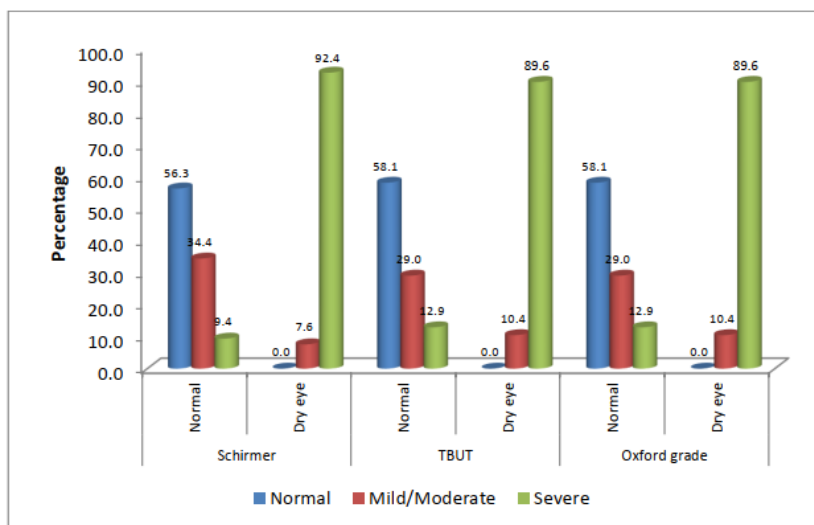


Figure 10: Association of dry eye and quality

**Impact of duration of postmenopausal period on quality of life:**

Table 13: Association of quality of life with postmenopausal period

Postmenopausal period (in years)	Normal		Mild/Moderate		Severe		$\chi^2$	P
	Count	Percentage	Count	Percentage	Count	Percentage		
<=10	11	26.8	6	14.6	24	58.5	3.37	0.186
>10	7	12.3	10	17.5	40	70.2		

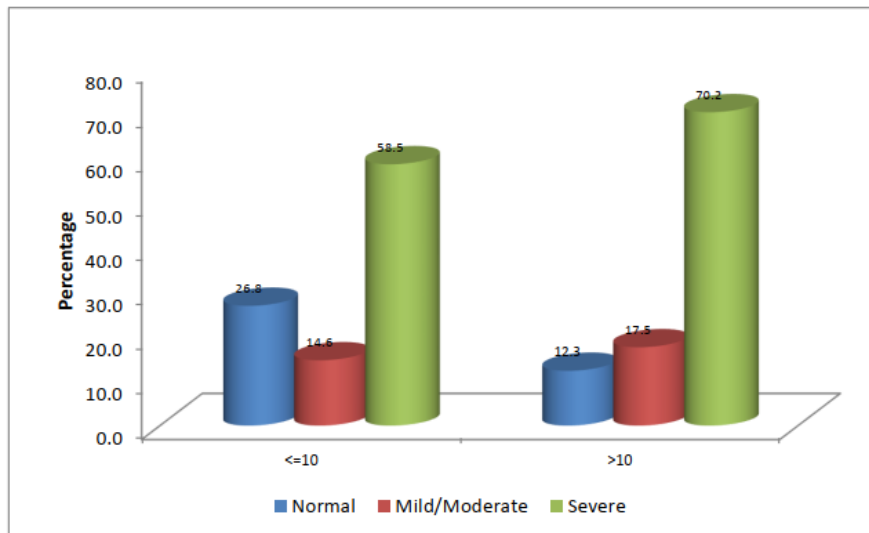


Figure 11: Association of quality of life with postmenopausal period

## DISCUSSION

- In this study we evaluated the proportion of dry eye among postmenopausal women and how it affects their quality of life.
- We studied 98 postmenopausal women of age group 51 to 80 years, mean age was found to be 63.2 years with a standard deviation of 6.9 and mean age of menopause was 49.9 years with a standard deviation of 1.3
- From our study, proportion of dry eye based on Schirmer test was found to be 67.3%, by TBUT test was 68.4% and by Oxford grading 68.4%. By oxford grading proportion of postmenopausal women with minimal dry eye was 60.2% and with mild dry eye was 8.2%. By OSDI score, 92.4% postmenopausal women with dry eye by Schirmer test were severely affected by dry eye, 89.6% of them with dry eye by TBUT were severely affected.
- From a study conducted by Garcia et al. mean age group was 54.18 years with a standard deviation of  $\pm 6.84$  years, mean age of menopause was 49.45 years with a standard deviation of  $\pm 4.02$  years. Overall prevalence of dry eye disease symptoms was 80.5% in postmenopausal women 37.7% had severe dry eye symptoms by OSDI score.(3)

In our study, among persons without dry eye by Schirmer test ,56.3% had normal quality of life,34.4% had mild to moderate deterioration in quality of life and 9.4% had severe deterioration in quality of life. By TBUT test 58.1% of those without dry eye had normal quality of life, 29% had mild to moderate deterioration in quality of life and 12.9% had severe deterioration in quality of life. By Oxford grading, among persons without dry eye ,58.1% had normal quality of life, 29% had mild to moderate deterioration in quality of life and 12.9 % had severe deterioration in quality of life. This could be explained by the fact that

1. There could be subjective errors in filling the questionnaire
2. There could be subclinical autoimmune diseases which was not identified during study
3. Influence of other environmental factors which produced dry eye symptoms

- From our study 78.57% had gritty eyes ,77.55% had blurred vision ,75.51% had painful eyes,68.36% had poor vision and 47.95% had sensitivity to light.
- From a study conducted by Garcia et al. 82.6% presented with sensitivity to light,67.1% with gritty sensation, 73.5% painful eye,68.8% blurred vision and 63.7% poor vision
- From a study by Intira Sriprasert et al. in 2016, it was found that both high and low estrogen levels have been associated with dry eye, low androgen levels are a more consistent factor. <sup>1</sup>
- From a meta-analysis of RCT conducted by Liu et al. in 2018, sex hormone therapy is useful for reducing symptoms of dry eye in postmenopausal women<sup>4</sup>
- From our study 70.2% of study participants with postmenopausal period more than 10 years has severe deterioration in quality of life compared to 58.5% in those with postmenopausal period less than or equal to 10 years.
- From a study conducted by Garcia et al and severity of dry eye increase with age and decrease with late onset of menopause.<sup>3</sup>

## CONCLUSION

Proportion of dry eye was found to be high in postmenopausal women and leads to severe deterioration of their quality of life. Alteration of sex hormones lead to abnormal tear film, which in turn leads to increased symptoms of dry eye. So there is a need to identify dry eye disease in postmenopausal women to maintain ocular surface health and regular ophthalmologic evaluation need to be done.



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