



Original Article

Comparison of Dry Eye in Pre and Post Menopause

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ABSTRACT

It is also known as Keratoconjunctivitis Sicca. **Objective:** of the study was to perceive the frequency of dry eyes in pre and post menopause. **Methods:** Women of age 45 to 70 were involved. Schirmer test was performed, the normal production level was considered over 10mm. The level under 10mm was categorized as moderate and <5mm was severe. It was a comparative cross-sectional study that was performed between January 2010 and May 2016. The study was performed at University of Lahore Teaching Hospital. The study included a total 326 female patients comprised of 126 premenopausal and 126 postmenopausal. The women aged between 40 to 70 years were agreed to participate. There is a questionnaire containing the questions about status of menopause i.e. pre and post and symptoms of dry eyes were used. Schirmer test 2 was performed and dry eye was evaluated on the basis of scoring of dry eyes symptoms. **Results:** In our study 87.8% among premenopausal were mild, 11.6% moderate and 0.6% severe. Among postmenopausal 7.4% were mild, 43.8% moderate and 48.8% severe. It was discovered that out of 164 premenopausal women 71.3% were facing watering and out of 162 postmenopausal women, 46.9% were facing watering. Among 164 premenopausal 72.6% were having eye redness and out of 162 postmenopausal 46.9%. Among 164 premenopausal 15.9% were facing difficulty in wearing contact lens and among postmenopausal were 48.1%. **Conclusion:** It was discovered that the dry eye is more customary in postmenopausal women. The Schirmer test showed that dry eye is more prevalent in postmenopausal women.

INTRODUCTION

Dry eye is a disease of the ocular surface in which there is a lack of homeostasis of the tear film. It is also known as Keratoconjunctivitis Sicca. It is a very common ophthalmic complaint that happens due to aqueous tear insufficiency [1]. DED is due to irritation of lacrimal gland neurotrophic shortage as well as due to dysfunction of the lacrimal gland. It affects the interpalpebral ocular surface and is linked by means of diversity of indicators reflecting ocular anxiety [2]. The dry eye disease (DED) symptoms include burning, itching, decreased vision, foreign body sensation, light sensitivity, redness, complexity wearing contact lens, watery eyes, complexity with driving at night time, grittiness or sandy sensation. These problems can have adverse effects on quality of life. Having dry eye symptoms can result in feelings like frustration, distress and awkwardness due to

eye redness. Particularly in women, self-esteem is also affected who were unable to wear makeup and contact lenses [3]. Tear film comprises of three significant coats: a mucin coat related with glycolax, a watery coat that accommodates lacrimal gland emissions and a lipid coat that is carried through the meibomian gland. Cold corneal thermo receptors show tear uprightness, and sign through neurotransmission to brainstem focuses to adjust lacrimal gland development. The nociceptors discriminate mechanical and compound aggravations, irritation and hyperosmolarity [4]. The outermost coat of tear film is covered by lipids. Surface tension is condensed by lipid layer of tear film. DED is related to variations in composition and properties of tear lipids. The structural and practical property of TFL is important for considerable tear film

purpose under equally usual and pathological circumstances. The important aspects of TFLL are confrontation adjacent to increased latera pressure as well as capability to increase tear film surface [5]. Dry eyes have the property that it can affect the feature of life such as pressurize the aptitude to use digital devices [6]. There is a possible link between dry eyes and menopause. Women are more exaggerated than men because of hormonal pressure [7]. Because of alteration in sex hormones all the three coats of tear film are affected, estrogen usually effects the lipid production [8]. The insufficiencies of androgen and estrogen are more probable to have visual surface damage as well as it is the indication of DED with age matched controls. The ovarian hormonal transformation may add to DED. Female sex hormones play a very fundamental role in reproduction, sexual expansion and common health. Sex hormones level alters with time, but the majority and pronounced changes occurs in puberty, pregnancy and menopause. The major glands that produces hormones are adrenal glands and gonads, which includes the ovaries in women and testes in men. These are concerned in puberty, sexual development, sexual desire, reproduction, regulating bone as well as muscle enlargement, promoting hair expansion. Changes in sex hormones have notable part in the physiology of DED. Dry eye disease stays unrecognized in a person's life. In more extreme cases immunomodulatory, and infrequently and careful surgical procedures are required. Female sex hormones levels are fluctuated by the factors like age, pregnancy, menstruation and menopause [9]. Menopause actually happens when an individual stops having menstrual periods and is not capable to get pregnant. In US, the standard age of women experiencing menopause is 52 years. Pre menopause is the most important phase, during this phase there is a lot of variations in these hormones and it can lead to the conditions such as irregular menstrual periods, hot flashes, mood swings, sleeplessness and vaginal dryness [10]. During menopause the estrogen decreases in a very irregular manner, its level fluctuates and becomes uncertain and the production decreases to a very low value. During menstrual cycle, the progesterone discontinues its production, but the mainly two that are mainly important and upsetting to women are hot flashes, insomnia and vaginal dryness. Other common symptoms are depression, loss of memory, deprived attentiveness and weariness [11]. The examination related to androgen and estrogen deficiencies indicated that they were bound to have visual surface impairment and indications of DED. The result was that the hormonal changes in ovaries may add to DED [12].

METHODS

It was a comparative cross-sectional study that was performed between January 2010 and May 2016. The study

was performed at University of Lahore Teaching Hospital. The study included a total 326 female patients comprised of 126 premenopausal and 126 postmenopausal. The women aged between 40 to 70 years were agreed to participate. There is a questionnaire containing the questions about status of menopause i.e. pre and post and symptoms of dry eyes were used. Schirmer test 2 was performed and dry eye was evaluated on the basis of scoring of dry eyes symptoms. Schirmer test with anesthesia was performed. In this study alkane drops were used and the whole procedure was well explained to the patient before performing. Schirmer test readings were noted in questionnaire as OD and OS and the symptoms of dry eyes like itching, watering, redness, burning sensation were noted as yes and no. Schirmer test strips were used with reading from 0 to 35mm. Patients with corneal disease or ulcer or having any such disease that can disturb the tear film and cause dry eye was excluded. Moreover, the pregnant women, smokers, diabetic, thyroid disorders or patients with systemic disease were not included in the study. It is performed in such a way that the in a confined room the patient was seated comfortably with fan off. Alkane drops were applied to the eye. The test was performed on both eyes at the same time and standardized Schirmer strips were inserted into conjunctival sac of lateral part of lower eyelid. The strips were removed after 5 minutes. We kept the standard that was Abnormal if <10mm/5min, Moderate if 10-15mm/5min, Normal if >5mm/5min

RESULTS

Out of 326 participants in which 164 were premenopausal and 162 were postmenopausal. Among premenopausal 87.8% (144) showed mild, 11.6% (19) moderate and 0.6% (1) severe. These were the Schirmer test results in right eye. Among postmenopausal 7.4% (12) showed mild, 44.4% (72) moderate and 48.1% (78) severe. The total 156 (47.9%) showed mild, 91 (27.9%) showed moderate and 79 (24.2%) showed severe in right eye. Schirmer test results of pre- and post-menopausal were significant as $p < 0.05$. In left eye among premenopausal 87.88% (144) showed mild, 11.6% (19) moderate and 0.6% (1) severe. Among postmenopausal 7.4% (12) showed mild, 43.8% (71) moderate and 48.8% (79) severe. The total 156 (47.9%) showed mild, 90 (27.6%) moderate and 80 (24.5%) severe. Chi square test was used for statistical analysis. After examining 326 women according to the questionnaire it was found that among 164 premenopausal women, 71.3% were having excessive watering and out of 162 postmenopausal women, 46.9% were having watering. Among 164 premenopausal women the prevalence of eye redness was 72.6%. Out of 162 postmenopausal women, 46.9% were having redness. The frequency of participants facing difficulty in wearing

contact lens among 164 premenopausal women was 15.9% and among postmenopausal women was 48.1%. The results uncover that postmenopausal women feel more difficulty in wearing contact lens as compared to premenopausal. Prevalence of participants facing difficulty in night time driving among 164 premenopausal women was 10.4% and among postmenopausal women was 33.3%. Among 164 premenopausal women 70.1% were facing dryness in areas like mouth, nose and vagina and among 162 postmenopausal women 92.0% were facing dryness in areas like mouth, nose and vagina. Prevalence of hot flashes among 164 premenopausal women was 73.8% and among postmenopausal women was 82.1%. Among 164 premenopausal women 97.6% were having mood swings and out of 162 postmenopausal women 96.3% were having mood swings. The prevalence participants suffering from sleeplessness among 164 premenopausal women was 81.1% and among 162 postmenopausal was 92.0%. According to these results the symptoms of dry eyes was more prevalent in postmenopausal women as compared to premenopausal women.

Status_of_ menopause	SCHIRMER TEST RESULT OF LEFT EYE			Total	P- Value
	10-15mm (mild)	5-10mm (moderate)	<5mm (severe)		
Premenopause	144(87.88%)	19(11.6%)	1(0.6%)	164(100.0%)	0.000
Postmenopause	12(7.4%)	71(43.8%)	79(48.8%)	162(100.0%)	
Total	156(47.9%)	90(27.6%)	80(24.5%)	326(100.0%)	

Table 1: Association Between Status of Menopause and Schirmer Test Results of Left Eye

Out of 326 participants, 164 were premenopausal and 162 were postmenopausal women. Among premenopausal women 87.88% showed mild, 11.6% moderate and 0.6% severe Schirmer test results in left eye. Among postmenopausal 7.4% showed mild, 43.8% moderate and 48.8% severe Schirmer test results in left eye. Schirmer test results in pre and postmenopausal women were significant as $p < 0.05$ was obtained. Chi-square test was used for statistical analysis (Table 1).

Status_of_ menopause	SCHIRMER TEST RESULT OF RIGHT EYE			Total	P-Value
	10-15mm (mild)	5-10mm (moderate)	<5mm (severe)		
Premenopause	144 (87.8%)	19 (11.6%)	1 (0.6%)	164(100%)	0.000
Postmenopause	12(7.4%)	72(44.4%)	78(48.1%)	162(100%)	
Total	156(47.9%)	91(27.9%)	79(24.2%)	326(100.0%)	

Table 2: Association Between Status of Menopause and Schirmer Test Results of Right Eye

Out of 326 participants, 164 were premenopausal and 162 were postmenopausal women. Among premenopausal 87.8% showed mild, 11.6% moderate and 0.6% severe Schirmer test results in right eye. Among postmenopausal 7.4% showed mild, 44.4% moderate and 48.1% severe Schirmer test results in right eye. Schirmer test results in

pre- and post-menopausal women were significant as $p < 0.05$ was obtained. Chi-square test was used for statistical analysis (Table 2).

DISCUSSION

Our study was conducted on pre- and post-menopausal ladies to find out dry eye symptoms. After performing the Schirmer test 2 on pre- and post-menopausal it was noticed that the postmenopausal had more dry eyes as compared to pre menopause. Schirmer test strips were graded as normal, moderate and severe. Symptoms we observed were scratchiness, watering, burning sensation, eye redness and mood swings which are more ordinary in postmenopausal ladies. So, it was concluded that postmenopausal were more possible to be suffered from DED as compared to pre-menopausal women. In previous similar study different ocular surface test such as Schirmer test with an aesthetic drops and corneal staining was performed on postmenopausal women of different age groups. Just like our study it has been shown that there is higher rate of dry eyes in post-menopausal females because age and hormonal changes play a vital role in visual surface changes. Another study was conducted to obtain the part of sex hormones such as estrogen and androgen in causing dry eye in menopausal women. To access the tear film production Schirmer test was performed on postmenopausal women of different age groups. Results concludes that the extent of dry eyes is more in postmenopausal women [13]. Comparative research was conducted between pre as well as post-menopausal women. Different tests like Schirmer test, tear break up time and OSDI was performed [14]. Similar to our results the results of this research showed that the post-menopausal women had more frequency of dry eyes. Women above 40 should go for detail eye examination to avoid complications. Similar research was conducted to investigate the relation of hormonal imbalance and dry eyes in pre and post females. It demonstrates that alteration in sex hormones greatly affects the ocular surface and tear film. Androgens and estrogens have been established to have an effect on tear production and function [15,16]. Despite of age and hormonal changes other factors such as pollution and smoke can also play a role in causing dry eye symptoms [17, 18]. As an increase in age hormonal imbalance happens due to different changes occurring in body. From the results of all the researches it was uncovered that post-menopausal women are vulnerable to DED as compared to pre-menopausal women. Dry eyes and increasing age are linked to each other, and the imbalance of hormones results in DED [19,20].

CONCLUSION

According to the questionnaire post-menopausal women

had more symptoms of dry eyes like excessive watering, irritation in eyes, dryness in nose, mouth and vagina, difficulty in wearing contact lens, difficulty in night time driving, hot flashes and sleeplessness as compared to premenopausal women. Moreover, the Schirmer test showed more range of moderate and severe dry eyes in post-menopausal women. So, it was concluded that the frequency of dry eye disease is more in post menopause as compared to pre menopause.

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