

EVALUATION OF SYMPTOMS IN POST-MENOPAUSAL WOMEN WITH DRY EYE SYNDROME

AUTHORS & CONTRIBUTORS:

Maham Waqar¹
Saman Ali²
Kashaf Nasir³

For Authors' affiliation & contribution
see end of Article

ABSTRACT

PURPOSE: To evaluate the symptoms of dry eye disease among postmenopausal women.

METHOD: A cross-sectional survey was conducted on 76 postmenopausal women. A questionnaire was made in order to gather information about their ocular discomforts due to dry eye. We also gathered information about their postmenopausal symptoms.

RESULTS: Watering, redness, irritation in eyes, blurred vision and burning sensation in eyes are most common symptoms of dry eye that occur from sometimes to very often among postmenopausal women (78.1%, 72%, 64.9%, 46.6% and 72% respectively). Some dry eye symptoms showed moderate and weak positive correlation with menopause symptoms. Photophobia showed moderate positive correlation with anxiety and hot flushes ($r=0.587$ and 0.535 respectively). Irritation in eyes showed moderate positive correlation with weight gain and hot flushes ($r=0.527$ and 0.544 respectively). Blurring in eyes showed weak positive correlation with weight gain, anxiety, hot flushes, night sweats, loss of breast fullness, mood changes ($r=0.371, 0.393, 0.438, 0.337, 0.325, 0.362$ respectively) and did not correlate moderately or strongly with any of the symptoms of menopause. Mucus in eyes showed moderate positive correlation with loss of breast fullness ($r=0.508$). Watering showed moderate positive correlation with vaginal dryness ($r=0.550$). Irritation in eyes in the morning showed moderate positive correlation with weight gain and night sweats ($r=0.511$ and 0.510 respectively). Some symptoms of dry eye such as opened eye sleep, eye fatigue and redness in eyes did not show any correlation with symptoms of menopause. Some correlations are also observed among the symptoms of dry eye disease. Burning sensation showed positively weak correlation with irritation in eyes and eye fatigue ($r=0.342$ and 0.365 respectively). Mucus in eyes showed weak positive correlation with photophobia, blurring and eye fatigue ($r=0.366, 0.361$ and 0.385 respectively). Photophobia showed weak positive correlation with blurring and irritation in eyes ($r=0.403$ and 0.389 respectively). Irritation in eyes showed weak positive correlation with blurring in eyes ($r=0.412$) and weak negative correlation with opened eye sleep ($r=-0.322$). Blurring in eyes showed weak positive correlation with irritation in the morning ($r=0.318$) and moderate positive correlation with eye fatigue ($r=0.572$). Eye fatigue and irritation in the morning showed weak positive correlation between them ($r=0.321$). Watering from eyes did not show any significant correlation with any other symptom of the dry eye.

CONCLUSION: Dry eye is one of the common diseases among postmenopausal women. A significant ratio of postmenopausal women are suffering from the symptoms of dry eye disease. There is no strong correlation between symptoms of dry eye and symptoms of menopause and there is no strong correlation between the symptoms of dry eye as well.

KEY WORDS: Dry Eye disease, postmenopausal women

INTRODUCTION

Dry eye or dry eye syndrome is an ischemic tear film and ocular surface condition. Dry eye can lead to disturbance in the stability of tear film and damage to the ocular surface. Dry eye is a condition that is also associated with ocular discomforts which may cause ocular pain.¹ In case of severity, visual disturbance due to dry eye can cause decrease in visual function that may lead to blindness.² There are multiple types of dryness namely:

Keratoconjunctivitis sicca term is associated with eyes with a certain level of dryness.

Xerophthalmia is a dry eye associated with a deficiency of vitamin A.³

Xerosis refers to the intense dryness of the skin and keratinization that happens in the eye with significant conjunctivitis issues.

Dry eyes can be caused by several factors that disturb the safe tear film. Through a disturbance in neuronally regulated blinking mechanism, the tear film is mechanically distributed along the ocular surface. Three variables are required for the successful resurfacing of the tear film:

Normal blink reflex.

Contact between the external ocular surface and

eyelids.

Normal corneal epithelium.

Disturbance in each of these variables may contribute to dry eye. Environmental factors such as ultraviolet (UV) radiations, ozone and exposure to the pollutants also take part in the advancement of dry eye because these factors increase oxidative stress.

As we know that tear film is made up of three layers: the lipid layer, the aqueous layer, and the mucus layer. Normally, this mixture keeps the surface of the eyes lubricated, clean, and smooth. Dry eyes may be triggered by problems with either of these layers. There are several causes including hormonal fluctuations, an autoimmune disorder, inflamed eyelid glands or allergic eye disease for tear film dysfunction.^{4,5} The cause of dry eyes for certain individuals have diminished tear production which is known as deficient dry eye or increased evaporation of tears which is known as evaporative dry eye.^{6,7}

Menopause is a time in the life of a woman where her menstrual cycle comes to an end.^{8,9} It usually occurs naturally and most commonly after the age of 45. FSH (Follicle-stimulating hormone) and LH (Luteinizing Hormone) will no longer perform their normal roles to regulate women's sex hormones i.e: estrogen, progesterone, and testosterone as ovaries age and release fewer hormones.^{1,7,8} These unavoidable hormone changes and the inevitable drop in estrogen levels during menopause may have a huge effect on women's health for years to come.

Androgen and estrogen are considered as two main sex hormones that have involvement in the maintenance of tear composition and ocular surface organization respectively.¹⁰

In case of post-menopausal syndrome, decreased sex hormone level results in ocular surface disruption and inflammation in the lacrimation gland due to that reason gland starts producing a lesser amount of tears because sex hormones play a significant role in the maintenance of normal ocular surface.¹¹ Before menopause, it is said that the greater the level of testosterone,

the lesser the production of tears, and the greater the level of estrogen, the greater the production of tears. During menopause, this process takes place in reverse order. Some researchers suggest that dry eyes are also associated with increase in estrogen levels. During some stages in the menstrual cycle, even when taking birth control pills, this could be the cause for a rise in dry eye symptoms.¹² Hence this is a disease (DED) that is fairly common in post-menopausal women and this study attempts to analyze this demographic to see if the symptoms that occur due to dry eye disease are related to each other.

MATERIALS AND METHODS

Data was collected using a self-designed Google Form (Questionnaire) which was filled by postmenopausal women with clinically diagnosed dry eye disease and filled concerning ocular discomforts and symptoms of menopause faced by them.

All data were entered and analyzed using the statistical package for social sciences (SPSS 20). The parametric evaluation was done by using categorical answers obtained from the survey and mapped onto values resulting in the statistical figures and graphs providing meaningful deductions.

RESULTS

Watering from the eye happened to 78.1% of women very often and 20.5% of women felt their eyes watering sometimes. 72% of women felt burning sensation in the eyes very often, 14.7% felt it sometimes and 13.3% of women did not feel it at all. Stringy mucus in or around the eye is considered a symptom of dry eye but 54.1% of women did not feel it at all. However, 37.9% of women had stringy mucus sometimes. Generally, eyes become more sensitive to light due to dryness in the eyes. According to results, 43.2% of women's eyes became highly sensitive towards light and 43.2% of women sometimes feel their eyes sensitive towards the light. Results also showed that 64.9% of women sometimes had a

sensation of something in their eyes (irritation), 20.3% of women had a constant feeling of something in their eyes and 4.9% did not feel it at all. 46.6% of women experienced blur vision sometimes and 19.2% did not have it at all. 50.7% of women had eye fatigue sometimes and 29.3% never had eye fatigue. It is said that people with dry eyes sleep with their eyes partly open, but results showed that 77.3% of women did not experience it at all. 73% of women sometimes had redness in their eyes due to DED and 14.7% did not have redness. People with dry eye disease usually felt irritation when they woke up in the morning. Only 18.9% of women felt irritation in the morning and 41.9% don't feel irritation (Table 1).

Table 1: Dry Eye Symptom Severity Data

Symptom	Never (%)	Sometimes (%)	Very often (%)
Burning sensation	13.3	72	14.7
Stringy mucus in the eyes	54.1	37.8	8.1
Sensitivity towards light	13.5	43.2	43.2
Sensation of having something in the eyes	14.9	64.9	20.3
Having blurred vision	19.2	46.6	34.2
Having eye fatigue	29.3	50.7	20.0
Watering from the eyes	1.9	20.5	78.1
Difficulty wearing contact lenses	88.0	4.0	8.0
Sleeping with the eyes partly open	77.3	22.7	0.0
Redness in the eyes	14.7	72.0	13.3
Irritation in the eyes when you wake up	41.9	39.2	18.9

Considering the above results vaginal dryness, weight gain, hot flushes, night sweats, and dry skin are the most common symptoms of menopause (Table 2).

Table 2: Menopause Symptom Severity Data

The numbers 1 to 5 indicate the severity of the symptom with 1 being the lowest severity and 5 being the highest.

Symptom	Severity Scale 1 to 5				
	1	2	3	4	5
Vaginal dryness	2	9	15	40	10
Weight gain	8	1	29	26	11
Anxiety	6	10	44	13	3
Hot flushes	7	0	9	43	17
Reduced libido	11	22	38	5	0
Night sweats	1	11	15	34	15
Loss of breast fullness	1	8	46	19	2
Dry skin	0	10	16	35	15
Mood changes	5	10	42	14	5
Sleep problems	5	24	39	6	2

Some dry eye symptoms showed moderate and low positive correlation with menopause symptoms. Burning sensation is positively correlated with vaginal dryness, weight gain, anxiety, hot flushes, reduced libido, night sweats and dry skin ($r=0.488, 0.474, 0.316, 0.426, 0.384, 0.469$ respectively). Mucus in eyes showed weak positive correlation with anxiety and dry skin ($r=0.359$ and 0.369 respectively). Mucus in eyes showed moderate positive correlation with loss of breast fullness ($r=0.508$). Photophobia showed weak positive correlation with vaginal dryness, weight gain, reduced libido, night sweats, loss of breast fullness dry skin and mood changes ($r=0.416, 0.384, 0.362, 0.470, 0.404, 0.370$ and 0.435 respectively). Photophobia showed moderate positive correlation with anxiety and hot flushes ($r=0.587$ and 0.535 respectively). Irritation in eyes showed weak positive correlation with vaginal dryness, anxiety, night sweats and mood changes ($r=0.468, 0.494, 0.487$ and 0.416 respectively). Irritation in eyes showed moderate positive correlation with weight gain and hot flushes ($r=0.527$ and 0.544 respectively). Blurring in eyes showed weak positive correlation with weight gain, anxiety, hot flushes, night sweats, loss of breast fullness, mood changes ($r=0.371, 0.393, 0.438, 0.337, 0.325, 0.362$ respectively) and did not correlate moderately or strongly with any of the symptoms of menopause. Watering from eyes showed weak positive correlation with weight gain, hot flushes, reduced libido and dry skin ($r=0.432, 0.498, 0.369$ and 0.364 respectively). Watering showed moderate positive correlation with vaginal dryness ($r=0.550$). Irritation in eyes in the morning showed weak positive correlation with vaginal dryness, hot flushes, loss of breast fullness and dry skin ($r=0.429, 0.402, 0.309$ and 0.377 respectively). This symptom showed moderate positive correlation with weight gain and night sweats ($r=0.511$ and 0.510 respectively). Some symptoms of dry eye such as eye sleep, eye fatigue and redness in eyes did not show any correlation with symptoms of menopause. There is no strong correlation

between symptoms dry eye and symptoms of menopause (Table 3).

Some correlations are also observed among the symptoms of dry eye disease. Burning sensation showed positively weak correlation with irritation in eyes and eye fatigue ($r=0.342$ and 0.365 respectively). Mucus in eyes showed weak positive correlation with photophobia, blurring and eye fatigue ($r=0.366$, 0.361 and 0.385 respectively). Photophobia showed weak positive correlation with blurring and irritation in eyes ($r=0.403$ and 0.389 respectively). Irritation in eyes showed weak positive correlation with blurring in eyes ($r=0.412$) and weak negative correlation with opened eye sleep ($r= -0.322$). blurring in eyes showed weak positive correlation with irritation in the morning ($r=0.318$) and moderate positive correlation with eye fatigue ($r=0.572$). Eye fatigue and irritation in the morning showed weak positive correlation between them ($r=0.321$). Watering from eyes did not show any significant correlation with any other symptom of the dry eye. There is no strong correlation between the symptoms of dry eye (Table 3).

Women have got menopause at the age of 50 (21.6%). 1.4% of women have got menopause at age 45, 1.4% at age 46, 2.7% at age 47, 8.1% at age 48, 12.2% at age 49, 14.9 at age 41. 16.2% at age 52, 9.5% at age 53, 2.7% at age 54 and 2.7% age 55.

CONCLUSION

It has been clearly seen that dry is a common disease among postmenopausal women. The reason for high prevalence of dry eye syndrome among postmenopausal women is hormonal changes. It can be due to environmental conditions or nutritional deficiency.

A huge ratio of post- menopausal women is facing different symptoms of dry eye syndrome. Therefore, evaluation of dry eye should be considered as an integral part of an ophthalmic examination of post-menopausal women and medical management should be taken on the count of the severity of dry eye disease. Many dry eye symptoms do have correlations with

symptoms of menopause. Dry eye is one of the symptoms of menopause in postmenopausal women.

REFERENCES

1. Perry HD. Dry eye disease: pathophysiology, classification, and diagnosis. *Am J Manag Care*. 2008;14(3):79-87.
2. Tavares Fde P, Fernandes RS, Bernardes TF, Bonfioli AA, Soares EJ. Dry eye disease. *Semin Ophthalmol*. 2010;25(3):84-93.
3. Sommer A. Xerophthalmia and vitamin A status. *Prog Retin Eye Res*. 1998;17(1):9-31.
4. Schaumberg DA, Buring JE, Sullivan DA, Dana MR. Hormone replacement therapy and dry eye syndrome. *JAMA*. 2001;286(17):2114-9.
5. Rp M, Vp S, S C, M R, T S, M R. Prevalence of severe dry eye disease in postmenopausal women in North India: A teaching hospital study. *Indian J Obstet Gynecol Res*. 2019;6(1):94-6.
6. Lemp MA. Evaluation and differential diagnosis of keratoconjunctivitis sicca. *J Rheumatol*. 1990;8(5):3-6.
7. Phadatare SP, Momin M, Nighojkar P, Askarkar S, Singh KK. A Comprehensive Review on Dry Eye Disease: Diagnosis, Medical Management, Recent Developments, and Future Challenges. *Advances in Pharmaceutics*. 2015;2015:1-12. DOI: 0.1155/2015/704946.
8. Dr Heidi D Nelson M. Menopause. *Lancet*. 2008;371(9614):760-770.
9. Alawlaqi A, Hammadeh M. Examining the relationship between hormone therapy and dry-eye syndrome in postmenopausal women: a cross-sectional comparison study. *Menopause*. 2016;23(5)550-5.
10. Lin T, Gong L. [Progression of research for the association between sex hormones and dry eye]. *Zhonghua Yan Ke Za Zhi*. 2014;50(1):65-8.
11. Knop E, Knop N Fau - Brewitt H, Brewitt H Fau - Pleyer U, Pleyer U Fau - Rieck P, Rieck P Fau - Seitz B, Seitz B Fau - Schirra F, et al. [Meibomian glands : part III. Dysfunction - argument for a discrete disease entity and as an important cause of dry eye]. *Ophthalmologie*. 2009;106(11):966-79.
12. Sriprasert I, Warren DW, Mircheff AK, Stanczyk FZ. Dry eye in postmenopausal women: a hormonal disorder. *Menopause*. 2016;23(3):343-51.