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Study of Dry Eyes in Post Menopausal Women-A Rural Hospital Based Study

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ABSTRACT: Purpose: To establish the occurrence and prevalence of dry eye in postmenopausal women in a rural hospital and also to establish the effect of age on dry eye.

Material and methods: Female patients of post menopausal age groups, i.e. 45 years and above age group, attending Ophthalmology Out Patient Department at Acharya Vinoba Bhave Rural Hospital, Sawangi, and Wardha underwent complete eye check-up.

Patients suffering from Lid disorders, trauma, diabetes, contact lens wearers, on medications which can cause dry eye and those not giving consent were excluded from the study. Their detailed ophthalmological examination was carried out and also their evaluation by physician was done. Schirmer's test I was done for diagnosis of dry eye.

Discussion: In this study, total 500 female patients were examined, out of which 185 fit the criteria for our study, i.e., they presented with dry eye. So the prevalence came out to be 37%. The 185 female patients included were between the age group of 45 and above years of age. So they were divided into five age groups. First 45 to 49 years of age which included 20 females, second was 50 to 54 years of age which included 31 females, third was 55 to 59 years of age which included 52 females, fourth was 60 to 64 years of age which included 60 females and fifth was above 64 years of age which included 22 females. According to our study, as age progressed, the percentage of patients with dry eye increased with the Pearson's Correlation Factor ($r=0.9714$). The minimum percentage of dry eye was in patients within age group of 45-49 years i.e. 30% while maximum number of patients with dry eye was in patients >64 years of age i.e. 44%. This proves that dry eye incidence increases in post menopausal women, as age progresses.

Conclusion: The prevalence of dry eye occurring in Central India among post menopausal women came out to be 37% in our study. Also it was established that as age progresses in post menopausal women, the prevalence of dry eye increases.

Keywords: Dry eye, Post-Menopausal Women, Prevalence.

I. INTRODUCTION

Dry eye or keratoconjunctivitis sicca refers to a variety of disorders, which is characterized by ocular surface disease that results from any condition that decreases tear secretion or increases tear film evaporation sufficient to result in loss of water from the tear film¹. Although it may sound like a minor annoyance, dry eye is a potentially serious and chronic condition. It may severely limit a person's activity, and in extreme cases, cause blindness.

According to the International Dry Eye Workshop in 2007, dry eye disease is defined as "a multifactorial disease of tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface."²

The daily activities that are impaired by dry eye disease include reading, using a computer, watching television, and driving during both day and night, leading to limited work productivity and quality of life.³ These effects are results of impaired visual acuity and of ocular discomfort that may include itching, burning, tearing, and grittiness (feeling of sand in the eyes).⁴ The discomfort, fatigue, and visual disturbances also impact social aspects of everyday life and psychological functioning.⁵ It is clear that dry eye disease is a growing public health problem; however, adequate treatment is lacking.⁶

Postmenopausal women are at greater risk of dry eye disease than younger women and men.⁶ As long ago as 1919⁷ ophthalmologists have reported observing dry eye disease more frequently in women than in men, noting that symptoms often present after menopause, and attributing the onset to hormonal changes.⁸ Modern epidemiologic studies have confirmed such observations. A review of population based epidemiologic studies of dry eye found that estimates of the prevalence range from 7.8% to 33.7%, depending on the population studied and the assessment methods used.⁹ In one population aged between 43 and 86 years, dry eye disease occurred in 13.3% and 21.6% during 5-9 and 10-year¹¹ follow-up periods, respectively; the incidence was greater in women (25.0%) than in men (17.2%), and was significantly associated with age.¹¹ Another group found that the prevalence of dry eye disease in men in the United States ranged from 3.9% among those 50 to 54 years to 7.67% among those 80 years and older, whereas in women, dry eye disease affected 6.02% among women 50 to 54 years to 9.8% among those 75 years and older; they concluded that, overall, dry eye disease affects 7.8% or 3.23 million women aged 50 years and older.^{12,13} The Women's Health Study and the Physicians' Health Studies also found that the frequency and severity of dry eye disease were significantly higher among women than in men.¹⁴ Women also reported a greater impact of the disease on everyday activities. They were more likely to use artificial tears and have greater dissatisfaction with treatment side effects, suggesting that dry eye disease has a disproportionate impact on women's well-being.¹⁴

After menopause, the level of estrogen in the blood decreases. Kramer¹⁵ in 1990 had shown that the eye is a locus of action of female sexual hormones. Sator¹⁶ proposed the reduction of naturally occurring estrogen as a possible reason for the occurrence of dry eye in menopausal women. 14.4% of the population in the Beaver Dam Eye Study had dry eye and the age-adjusted prevalence in women was 16.7% compared to 11.4% in men¹⁷⁻²⁰

II. AIM

To establish the occurrence and prevalence of dry eye in postmenopausal women in a rural hospital and also to establish the effect of age on dry eye.

III. MATERIALS AND METHODS

Study Design:

This is a clinical cross-sectional study.

Study Setting:

This study was conducted in the Department of Ophthalmology, Acharya Vinoba Bhave Rural Hospital (AVBRH), attached to Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, Maharashtra.

Period of study:

6 months for data collection and data analysis

Sample size:

In this study, total 500 female patients were examined. The age group was 50-80 years of age.

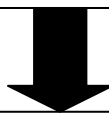
Ethical Issues:

The study was sent to the ethical committee and only after that enrolment of patients was started. All the investigations were provided free of cost to the patients.

Study Subjects:

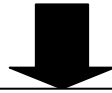
Subjects Selection:

Female patients of post menopausal age groups, i.e. 45 years and above age group, attending Ophthalmology Out Patient Department at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha underwent complete eye check-up.



Tests:

- (i) Visual Acuity Testing using Snellen's Chart at 6m distance
- (ii) Anterior Segment Examination using a Slit Lamp
- (iii) Intraocular pressure measurement using Pneumotonometry(TOPCON CT-80(computerised tonometer)MADE IN JAPAN.



Enrollment of subjects through clinical experts was done if:

1. Refraction within ± 5.0 diopters of spherical equivalent.
2. Intraocular pressure ≤ 21 mm Hg.
3. Normal anterior chamber,
4. Best- corrected visual acuity of 6/9 or more

If the patient had any one of the following, they were excluded from the study:

- 1) Lid disorders
- 2) Trauma
- 3) Diabetes,
- 4) Contact lens wearers
- 5) On medications which can cause dry eye.



Informed consent was taken. Patients who did not give valid consent for the study were excluded from the study.



The diagnosis of dry eye or Kerato conjunctivitis sicca in this study was made according to Schirmer's test



Methods

(1) Schirmer's test :The Schirmer's test was performed. This test was done without topical anesthetic agent as it would alter the results(Schirmer's Test 1). Both eyes were subjected to the test simultaneously and the special standardized filter paper (Whatman's no.41) was inserted successively into each conjunctival sac of the lateral part of the lower eyelid of each eye at the shortest possible interval. The filter paper was removed after 5 minutes and was read immediately. The values were read as:

- 1) < 5 mm-pathological
- 2) 5-10mm suspicious
- 3) > 10 mm-normal.

Patients with reading of < 5 mm were taken as those having dry eye.

RESULTS

In this study, (Table1)total 500 female patients were examined, out of which 315 patients who did not fit the inclusion criteria or which came in the exclusion criteria were excluded. Rest 185 patients who fit the criteria for our study , i.e. , they presented with dry eye were included in our study. So the prevalence came out to be 37%. As age progressed,(Table 2) the percentage of patients with dry eye increased with the Pearson's Correlation Factor ($r=0.9714$).The minimum percentage of dry eye was in patients within age group of 45-49 years i.e. 30% while maximum number of patients with dry eye was in patients >64 years of age i.e. 44%.This proves that dry eye incidence increases in post menopausal women ,as age progresses.

Table 1: Showing Dry Eye prevalence in post-menopausal women

Total No. of Patients	No. of Patients with Dry Eye
500	185(37%)

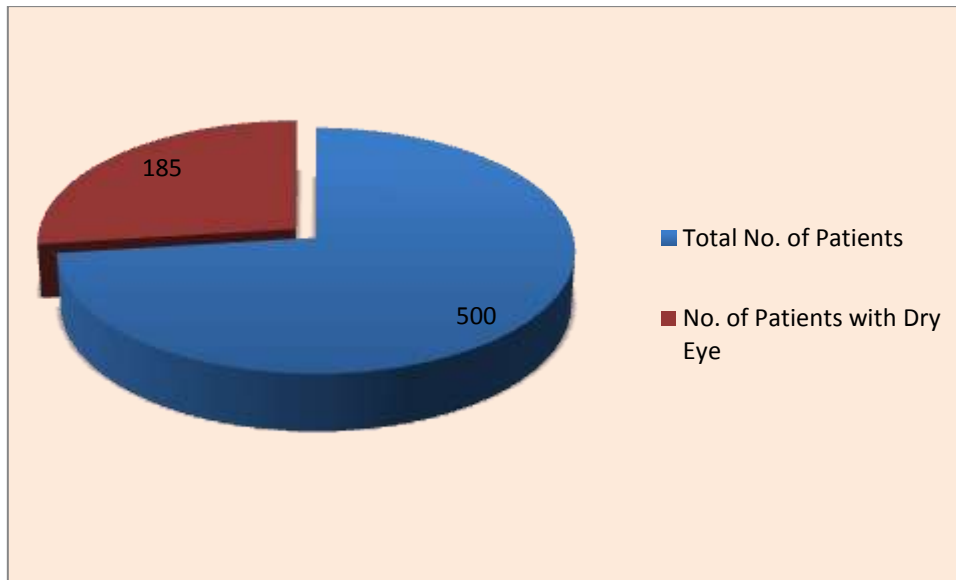


Figure 1: Showing Dry Eye prevalence in post-menopausal women

Table 2. Showing distribution of patients with and without Dry Eye according to Age

Age of Patients(years)	Percentage of Patients without Dry Eye	Percentage of Patients with Dry Eye	Pearson Correlation Factor (r)
45-49	70	30	0.9714
50-54	69	31	
55-59	65	35	
60-64	58	42	
>64	56	44	

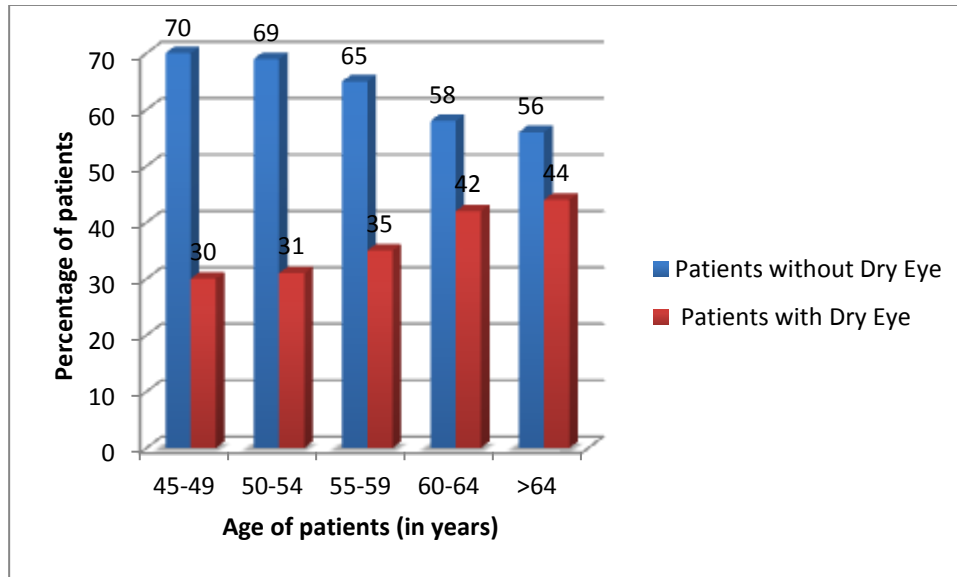
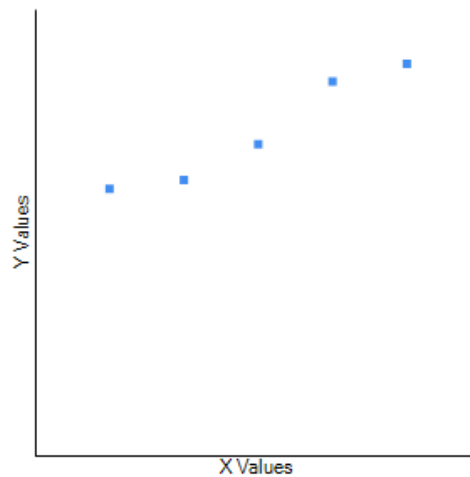


Figure 2: Showing distribution of patients with and without Dry Eye according to Age



DISCUSSION

1) In this study, total 500 female patients were examined, out of which 185 fit the criteria for our study, i.e., they presented with dry eye. So the prevalence came out to be 37%.

2) The 185 female patients included were between the age group of 45 and above years of age. So they were divided into five age groups. First 45 to 49 years of age which included 20 females, second was 50 to 54 years of age which included 31 females, third was 55 to 59 years of age which included 52 females, fourth was 60 to 64 years of age which included 60 females and fifth was above 64 years of age which included 22 females.

3) According to our study, as age progressed, the percentage of patients with dry eye increased with the Pearson's Correlation Factor ($r=0.9714$). The minimum percentage of dry eye was in patients within age group of 45-49 years i.e. 30% while maximum number of patients with dry eye was in patients >64 years of age i.e. 44%. This proves that dry eye incidence increases in postmenopausal women, as age progresses.

Generally, the prevalence of DES is known to increase with age.²¹ There are various hypotheses to support this, one important hypothesis being age-related decrease in meibomian gland secretion possibly due to atrophy of acinar cells, similar to age-related decline in the function of other sebaceous glands. Also aging is associated with alterations in the quality of meibomian gland secretions. The lacrimal gland also appears to undergo a number of age-related changes.²² Several data in literature suggest a major influence of gender and sex hormones on the physiology of the lacrimal gland and that they are involved in the pathogenesis of DES. It also occurs mainly in women and its appearance is frequently related to marked variations in serum sex hormone levels like menopause.²³ The data from a study done by Caterina Gagliano, et al suggest that deficiency in sexual hormones may cause not only a reduction in tear production leading to aqueous-deficient dry eye, but also a dysfunction in meibomian gland function determining an evaporative dry eye.²⁴ In our study too, we obtained a co-relation between the presence of DES and postmenopausal women. Thus, as in Beaver Dam Offspring Study prevalence of dry eye symptoms increased with age in women.²⁵ The drawback in our study is the lack of tests for hormonal levels which would prove the association of dry eye

in elderly women. Also newer techniques like biomarkers of dry eye disease, image analysis software to evaluate tear smoothness and stability noninvasively, would provide better analysis. Studies using these non-invasive devices have found more rapid and extensive ring distortion (break-up) in tear dysfunction that correlates with severity of corneal epithelial disease.^{26,27}

CONCLUSION

The prevalence of dry eye occurring in Central India among post menopausal women came out to be 37% in our study. Also it was established that as age progresses in post menopausal women, the prevalence of dry eye increases.

As knowledge of a normal data base is a must to diagnose various diseases and also as few studies have been done in relation of this, this data would contribute in establishing a database for Indian eyes which varies significantly in various regions of the world.

In conclusion, we would also like to add that it is imperative for dry eye examination to be a part of assessment in post-menopausal women especially those with symptoms.²¹

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