



## Original Research Article

## Comparative study of occurrence of dry eye between postmenopausal woman taking hormonal replacement therapy and without hormonal replacement therapy

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## ABSTRACT

**Aim:** To compare occurrence of dry eye between postmenopausal woman taking hormonal replacement therapy and without hormonal replacement therapy.

**Materials and Methods:** A comparative study was done to determine the occurrence of dry eye in those women with hormonal replacement therapy and control subject. Study was done in tertiary eye care hospital with patients of postmenopausal women taking hormonal replacement therapy and postmenopausal women who were not taking hormone replacement therapy from Jan 2019-June 2019. Schirmer's test, tear film breakup time and Rose Bengal staining were performed on all participants.

**Results:** 40 women were examined. Group A-15 were taking hormone both estrogen and progesterone. Group B -25 patients who are not taking hormone replacement therapy. Dry eye was found in women who are not taking hormone replacement therapy.

**Conclusion:** Dry eye was more common in post menopausal women who are not taking hormonal therapy as compared to post menopausal women taking hormone replacement therapy in our study. It shows female hormone is protective against dry eye.

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### 1. Introduction

For many decades Dry eye disease was thought to be limited to dryness of the eye due to reduction of aqueous phase of the tear film. In 1995 Dry eye was defined “as a complex multifaceted group of medical and ocular diseases that is due to decreased tear production and or increase tear evaporation.” The proposed definition of dry eye is a disease of ocular surface attributable to the different disturbances of natural function and protective mechanism of external eye, leading to unstable tear film during the open eye state which has been modified to the new definition by dry eye workshop study as dry eye is a “multifactorial disease of tears and ocular surface that results in symptoms of discomfort, visual disturbance and tear film instability with potential damage to ocular surface. It is accompanied by increased osmolarity of tear film and inflammation of ocular surface”.

Dry eye disease is one of the most common reason for patients to visit an eye care professional and is one of the most frequently encountered ocular morbidity making in a growing public health problem. Eyes are the most precious and delicate organ of our body. Proper lubrication of outer surface is essential for comfort of eyes as well as clarity of vision, which is maintained by tear film. Decrease in tear secretion, improper stability of tear film due to defect of any layers of tear film give rise to dry eye leading to symptoms of gritty sensation, foreign body sensation, itching, burning sensation ultimately blurring of vision. Additionally, dry eye disease can be categorized as episodic or chronic. Episodic dry eye occurs when environmental or visual tasks with reduced blinking overwhelm the stability of the tear and produce symptomatic dry eye. Chronic dry eye aggravated by same environmental conditions persists with symptoms and possible damage to the ocular surface. An indoor working environment can cause symptoms of ocular irritation, particularly those who use computers

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in air-conditioned workplaces, as low humidity, poor air quality and pollution are risk and cause dry eye diseases. The prevalence of dry eye is 5-34%, out of which there is higher incidence of women than men. Prevalence increase with age, female sex, current smoking history, ophthalmic surgery, contact lens wear with coexisting ocular condition like meibomian gland dysfunction, pterygium, blepharitis, and conjunctival disease. More frequently found in patients with arthritis, thyroid dysfunction and poor general health. Several risk factors have reported to increase dry eye diseases such as long term contact lens wearer and refractive surgery such as LASIK (laser assisted in situ keratomileusis) or photorefractive keratectomy (LASIK) surgery as it may result in lacrimal dysfunction and decreased goblet cell density, leading to reduced tear production and unstable tear film. Patients having vitamin A deficiency, Stevens Johnson Syndrome, alkali burn, keratoconjunctivitis Sicca, cicatricial pemphigoid frequently have clinical features of dry eye diseases. With the number of patients presenting with symptoms of dry eye ever increasing, the continuously changing lifestyle and environment, the development of newer diagnostic instruments, and the recent knowledge of the dry eye we are today better equipped to treat dry eye. However a better understanding of the key and important presenting symptoms, the external and systemic factors contributing to dry eye and the ideal battery of tests for dry eye will help in early diagnosis of this chronic condition, with more efficient and effective treatment and long term patient satisfaction. It may be diagnosed based only on signs observed by a health care professional in the absence of symptoms/complaints by the patients. The precorneal tear film is the sheet of tears, which covers the exposed interpalpebral portion of the globe and cornea. The portion overlying the cornea is the precorneal tear film. Most of the tear disappear in to the lacrimal sac and nasopharynx and some disappear by evaporation. The effect of ageing and treatment of dry eye involve the challenges and frustrations associated with the management of a chronic diseases. In this case, the goals are the preservation of vision and relief of discomfort. It should be emphasized to patient that there is generally no cure of their affliction but with proper attention and adequate treatment regimen, it is likely that good vision can be preserved through out life and considerable degree of comfort is afforded. Successful management of a chronic condition such as dry eye involves a partnership between physician and patient is in question. Continous application of therapeutic measures and careful experimentations are all ingredients of treatment

## 2. Materials and Methods

A comparative study was done to determine the occurrence of dry eye in those women with hormonal replacement therapy and women who were not taking hormone replacement therapy. Study was done in tertiary eye care

hospital with patients of postmenopausal women taking hormonal replacement therapy and postmenopausal women who were not taking hormone replacement therapy from Jan 2019-June 2019. Schirmer's test, tear film breakup time and Rose Bengal staining were performed on all participants

### 2.1. Inclusion criteria

Post menopausal women who have given consent for the study

Post menopausal women who were taking hormone replacement therapy

### 2.2. Exclusion criteria

Patients with previous history of dry eye

Diabetes

Associated systemic disease

Leprosy

Trauma

Contact lens wearer

Patients taking antihypertensive drugs

Computer users

Patients taking antipsychotic drugs

### 2.3. Diagnosis was done with the help of

Tear film break up time abnormal if <10sec

Schirmer's test abnormal if <10mm/5min

Rose Bengal test abnormal if >4 points

Schirmer's test

This test was performed before the other tests as it had to be done before instillation of anaesthesia.

Schirmer's test abnormal if <10mm/5min

It was done using 5×35mm sterile strips of Whatman No.41 filter paper. Patient was made to sit in relatively dark room with fan switched off. The terminal round end of the strip was folded at the pre marked area along 90° angle. Touching the paper directly with the finger was avoided in order to avoid contamination of skin oils. The patient was then asked to look up, lower lid retracted and the test paper inserted in the lower conjunctival sac at the junction of medial 2/3<sup>rd</sup> and lateral 1/3<sup>rd</sup> of the lid.

Adequate care was taken during the procedure to ensure that the paper did not touch cornea, in order to avoid reflex tearing. The patient was advised to blink normally. At the end of 5 minutes, the strips were removed and the length of filter paper moistened was measured in mm starting from the fold.

### 2.4. Interpretation

Measurements of <10mm were considered to be positive.

Readings >= 10mm were considered as negative.

### 2.5. Tear film break up time

The TBUT is the time in seconds between the last blink and the appearance of the dry spot.

### 2.6. Procedure

The patient was seated at the slit lamp. After instilling a drop of 2% fluorescein into the right eye, the patient was asked to blink a few times and place his head in the slit lamp. Then he/she was asked to look straight ahead without blinking. The tear film was observed, by moving the beam of the slit lamp from limbus to limbus, watching for an area of tear film rupture manifested by black island within the green sea of fluorescein. The time elapsed between the last blink and appearance of first black spot was termed as tear film break up time and noted in seconds. This kind of measurement was taken for three successive blinks and the mean of this was noted as the final reading.

### 2.7. Interpretation

Break up time of less than 10 seconds was considered positive, indicative of dry eye. Greater than or equal to 10 seconds was considered negative.

### 2.8. Rose Bengal test

It is a measure of assessing ocular surface damage using the Rose Bengal dye.

#### 2.8.1. Procedure

One drop of antibiotic solution was put on a sterile, commercially available rose Bengal strip. This drop was allowed to roll into the lower cul de sac of each eye. After 15 seconds, this eye was examined for staining of cornea and conjunctiva.

The amount of staining in 6 areas of eye was then recorded and graded based on modified Van Bijsterveld Rose Bengal grading map. A quantitative scale of 0 to 3 was used in each area of the conjunctiva of each eye.

### 2.9. Interpretation

An additive score of total 4 or more in the eye constituted a positive test. Less than this value was considered as a negative test.

## 3. Result

40 women were examined. Group A-15(37.5%) patients who were taking hormone both estrogen and progesterone.

Group B -25 (62.5%) patients who were not taking hormone replacement therapy.

Dry eye was found in women who are not taking hormone replacement therapy

From the above table it is revealed that out of 40 patients, 15(37.5%) patients were taking hormonal therapy and dry eye was absent in all the patients, they were symptomless. 25 (62.5%) patients were not taking hormone replacement therapy and dry eye was present in all patients

From the above table it is revealed that Of 15 patients who were taking hormone replacement therapy, TBUT value 10-15 in mm present in 5 patients, and >15 in mm present in 10 patients. Of 25 patients, TBUT value 0-5 in mm present in 15 patients and 5-10 in mm present in 10 patients.

From the above table it is revealed that of 15 patients who were taking hormone therapy, Schirmer's test value 10-15 was in 6 patients and value >15 in 9 patients. of 25 patients who were not taking hormone therapy, Schirmer's test value 0-5 in 13 patients and value 5-10 in 12 patients

From the above table it is revealed that of 15 patients who were taking hormone therapy Rose Bengal score is 0 in 9 patients and 1-3 in 9 patients. Of 25 patients who were not taking hormone replacement therapy Rose Bengal score 4-6 is present in 10 patients and score 7-9 present in 15 patients.

## 4. Discussion

This study was designed to detect dry eye with the help of tests like Schirmer's test, Tear film breakup time, Rose Bengal test and established a diagnosis

Group A- patients were taking hormone replacement therapy

TBUT value lies in 10-15 in mm and >15mm

Schirmer's test value lies 10-15 and >15

Rose Bengal score lies 0 and 0-3

Group – B – patients were not taking hormone replacement therapy

Group – B – patients were not taking hormone replacement therapy

TBUT value lies in 0-5mm and 6-10 mm

Schirmer's test value lies 0-5 and 6-10

Rose Bengal score lies 4-6 and 7-9

TBUT value lies in 10-15 in mm and >15mm

We found that dry eye is more common in post-menopausal women not taking hormone replacement therapy. So female hormone plays a protective role in dry eye.

Tear film has 3 components

Aqueous –secreted by lacrimal gland

Lipid –secreted by meibomian gland

Mucin –secreted by conjunctival goblet cells

Sex steroid present on meibomian gland is responsible for producing oil component of tear which prevents evaporation. So it shows hormone is protective component for dry eye.

But exact relation of sex hormone and symptoms of dry eye is unclear.

However many studies revealed that dry eye is more common in women who are taking hormone replacement

**Table 1:**

	Number of patients	Dry eye
Patients taking estrogen and progesterone	15(37.5%)	Absent
Patients not taking hormone replacement therapy	25(62.5%)	Present

**Table 2:** Chief complaints of dry eye symptoms not taking hormone replacement therapy

Dry eye symptoms
Eye strain +dryness
Dryness +foreign body sensation
Foreign body sensation+tearing
Tearing +itching
Itching +photophobia
Photophobia +tearing

**Table 3:** TBUT of patients taking hormone replacement therapy and not taking hormone replacement therapy

TBUT (in mm)	Patients taking estrogen and progesterone	Patients not taking hormone replacement therapy
0-5	-	15
5-10	-	10
10-15	5	-
>15	10	-

**Table 4:** Schirmer’s test of patients in having hormone replacement therapy and without hormone replacement therapy

Schirmer’s reading (in mm)	Patients taking estrogen and progesterone	Patients not taking hormone replacement therapy
0-5	-	13
5-10	-	12
10-15	6	-
>15	9	-

**Table 5:** Rose Bengal test of patients in having hormone replacement therapy and without hormone replacement therapy

Rose Bengal score	Patients taking estrogen and progesterone	Patients not taking hormone replacement therapy
0	9	-
1-3	6	-
4-6	-	10
7-9	-	15

therapy than women who are not taking hormone replacement therapy, but our study contradict this.

So a possible reason of this fact is our conclusion drawn from patients symptoms and our clinical diagnosis.

**5. Conclusion**

Dry eye was more common in post menopausal women who are not taking hormonal replacement therapy as compared to post menopausal women who are taking hormonal therapy. This show female hormone is playing a protective role in occurrence of dry eye.

**6. Source of funding**

None.

**7. Conflict of interest**

None.

**8. References**

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