

Association of Dry Eye with Adult Seborrheic Dermatitis and Seborrheic Blepharitis According to Tear Break-up Time

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ABSTRACT

Background and Objectives: Now a days, many people complain of eye irritation, dryness and itching, specially those who have dandruff in their head. This dandruff can be the cause of dry eye. In the skin diseases, seborrheic dermatitis and seborrheic blepharitis there are chances of dry eye whose symptoms cannot be relieved until we treat these diseases because the cause of this dry eye is dehydrated skin. If these skin diseases are left untreated they can cause further damage to eye such as corneal erosions. Purpose of this study was to find out the frequency of dry eye in 30 people (male and female) who were suffering from the seborrheic dermatitis and seborrheic blepharitis.

METHODOLOGY: A cross-sectional study was conducted at Madinah Teaching Hospital, Faisalabad, which included 30 patients, already suffering from Seborrheic Dermatitis and Seborrheic Blepharitis, aged 20-40 years. Tear Break-up time test was performed using Slit-Lamp examination under Cobalt Blue filter with Fluorescein dye. The data was analyzed using SPSS software version 20.

RESULTS: : In the study, out of 30 patients, 23.3% were male and 76.7% were female. In case of SB, 83.3% females had dry eye and all males 100% had dry eye. While in case of SD, 91% females and 100% males had dry eye. And the results showed that dry eye was more marked in right eye as compared to left eye with 19 out of 30 patients having symptoms more prominent in their right eye.

CONCLUSION: There is a strong association between dry eye, SD and SB. TBUT was seen to be low in right eye as compared to left eye. Out of 30 patients, 23 patients had dry eye. And the results showed that dry eye was more marked in the patients of SD than SB.

KEYWORDS: TBUT, Seborrheic dermatitis, Seborrheic Blepharitis, Dry eye.

INTRODUCTION

Seborrheic dermatitis (SD) is a very common chronic dermatosis characterized by redness and scaling and occurring in the regions where the sebaceous glands are most active such as the face and scalp, the pre-sternal area, and in the body folds. It has two types, infantile and adult. Infantile is usually common during first three months of life while adult type is prevalent between 20 to 50 years or older (1).

It is a skin condition in which very high amount of sebum is produced usually affecting the areas of scalp, face and trunk that are richly supplied with the follicles of sebaceous glands that can lead to crusty, yellow-brown flakes (1).

Seborrheic eczematid is the mildest form of the disease (eczematid=eczema-like, dermatitis like) in

which there is mild redness, scaling and seborrhea and often pruritis. The exact etiology is still unknown but it is thought to be linked with inflammation of sebaceous glands due to aerobic bacteria and fungus like *Malassezia furfur*. It is usually seen among the patients with Parkinson's disease, facial paralysis and HIV patients (2).

Seborrheic dermatitis has gradual onset that can get worse or aggravate in winter season, indoor environment and sunlight however some patients improve their symptoms when exposed to sunlight. The course of disease may end from years to decades (1).

Its skin symptom includes pruritis that is also associated with dry skin that increases with the age thus seen in older adults. Patient with associated pruritis often

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comes with redness, bumps, blisters on itchy skin that can even bleed in severe conditions. Repeated episodes of SD especially on the scalp may cause alopecia in severe cases due to secondary infection (1). Seborrheic blepharitis is the type of anterior blepharitis that is caused by the dandruff of the scalp and eye brows that causes stickiness of eye lashes and greasy lid margins with hyperemic surface. Soft scales and flakes of dandruff are found on the anterior lid margin and lashes (3).

People of all ages are affected by it. It is more often a dermatological condition that presents with many symptoms that are similar to other skin problems like eczema and seborrheic dermatitis especially when it becomes more oily and greasy. The causative agent of seborrheic blepharitis is a type of fungi called *Malassezia furfur* that is one of the normal flora of skin. Its inflammatory reaction to the skin can cause this type of blepharitis (4).

Now, evaporative dry eye is the disease that is found in the patients of both above discussed skin disorders. Dry eye results when there is inadequacy of tear volume or function that can lead to instability of tear film and damage to ocular surface(4).

There are 3 layers of tear film:

1. Outermost is the Lipid layer that is secreted by meibomian glands. Its thickness is 0.1 μm .
2. Aqueous layer that is secreted by the lacrimal glands. Its thickness is 7 μm .
3. Inner most is the mucous layer that is secreted by the goblet cells of conjunctiva. Its thickness is 0.2 μm (3).
4. The lipid part of tear film is increased in seborrheic conditions and dry eye symptoms are very common due to excessive oily secretions (5).
5. LIPID layer of tear film binds or seals the tear film thus any disturbance in this outer most layer can cause evaporative dry eye.

The test that was employed to test the diagnosed patients for dry eye was TBUT that stands for Tear Break-up time test. TBUT is defined as the time that is counted from the patient's last eye blink until the appearance of first dry spot in the patient's tear film that was stained with fluorescein dye. This test is most commonly used in the clinical practice to assess evaporative dry eye disease among the patients. In this method, slit-lamp along with cobalt-blue filter is used on fluorescein stained eyes of the patients to check the stability of their tear film (7).

TBUT is the time taken by the first dry spot to appear

in the tear film after a complete blink of the patient.

- Normal value is 10 to 15 seconds.
- Marginal value is 5 to 10 seconds.
- Less than 5 seconds is considered to be an indicator of severe dry eye or poor tear film (12).
- TBUT can be significantly low or abnormal in mucin and lipid deficiency which are two of the main layers of tear film contributing towards dry-eye. There are several causes or factor that can lead to low TBUT. These include limbal dermoid, corneal scars, pterygium and leprosy (6).

It can also be low in case of contact-lens users who use C.L solutions mainly containing a preservative called Benzalkonium chloride. Hypertensive patients on topical Beta blockers can also have decreased Break-up time. Moreover, the Smokers are also at the risk of reduced TBUT because they are exposed to cigarette smoke that can alter the tear film regularity.

If there is the appearance of dry spot on the same point or location always then it is due to irregular corneal surface mainly due to defect in the basement membrane of corneal epithelium. It has no association with dry eye or any instability in tear film (3).

Thus, we diagnosed the dry eye symptoms among the patients of Adult Seborrheic dermatitis and Seborrheic blepharitis using Tear Break-up time test.

METHODOLOGY

This Descriptive Study was carried out on 30 diagnosed patients of Seborrheic Dermatitis taken from Dermatology department and 30 diagnosed patients of Seborrheic Blepharitis taken from Ophthalmology department in Madinah Teaching Hospital (MTH), Faisalabad. The study was conducted from November, 2017 to May, 2018.

Purposive sampling was used to collect data on 30 patients. Purposive sampling is a type of non-probability sampling which is used for a specific purpose and a specific group of people or sample is chosen by keeping in mind the objectives of study(8). It is also known as judgmental, subjective or selective sampling (11).

Inclusion Criteria of the study:

- Age-group : 20-40 years
- Gender : both male and female
- Patients with Seborrheic dermatitis as diagnosed by the consultant dermatologist.

Patients with Seborrheic blepharitis as diagnosed by the consultant ophthalmologist.

Consent was taken after explaining the whole procedure to the patients and they were assured that the involved test was minimally invasive and harmless.

We took the relevant ocular and medical history from the patient, and performed anterior eye examination with torch light to exclude any anterior eye pathology. We recorded the visual acuity of the patients; finally we measured Tear Break-up time with slit-lamp under cobalt blue filter after the administration of fluorescein dye and recorded 3 readings per eye by using stopwatch and their mean reading was calculated.

A performa was filled that was made to record the Tear Breakup time values of the patients.

A drop of 2% fluorescein dye is instilled into the testing eye of the patient and the patient is seated comfortably in front of the slit-lamp. Table height of slit-lamp is adjusted according to patient's height, patient is asked to place his/her chin on the chin rest and forehead against the forehead band.

The slit-lamp was made to work at wide beam along with the cobalt blue filter so that the patient's eye that was stained with fluorescein dye can be viewed easily. The patient was instructed to blink several times then stop blinking during the test. The patient's cornea was viewed under the wide beam and cobalt blue filter and the time was noted until there appeared first dry patch in the tear film. The time was counted with the help of stop watch. This times that was measured in seconds is the Tear Break-up time for the respective patient. At the minimum, 3 readings were noted and their mean or average was taken to calculate TBUT.

The patients who were having SD also had flakes of dandruff on their eye lashes with associated itching which showed that there is relationship between these two conditions.

Normal value of Tear Breakup time: 10-40 seconds.

However if TBUT is less than 10 seconds then is indicative of dry eye (6).

Fluorescein strips are the strips that are infused with a green colored (under white light) 1-2% fluorescein dye. These strips prior to use were made wet with a drop of saline or any anesthetic agent and then allowed to touch the inferior lid margin of the patient's eyelid. The dye got spread within 10-30 seconds. Then the patient who was seated in front of slit-lamp was tested for TBUT test, to assess the stability of tear film.

The portions of the eye that were stained with fluorescein dye appeared blue under cobalt-blue filter that was adjusted in slit-lamp (10).

RESULTS

Table-1 below shows the frequency distribution according to age of patients .The number of subjects in our study were n=30. Out of these 73.3% were in first

age group (20-25), 6.7% were in 2nd group (26-30), 13.3% were in 3rd age group(31-35)and 6.7% were in 4th age group that is 36-40 years.

Table-1: Frequency distribution of age Age Groups

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 20-25	22	73.3	73.3	73.3
26-30	2	6.7	6.7	80.0
31-35	4	13.3	13.3	93.3
36-40	2	6.7	6.7	100.0
Total	30	100.0	100.0	

The table below shows the frequency distribution according to gender of the patients. Out of 30 patients reported, 23.3% were male and 76.7% were female.

Table-2: Frequency distribution of gender Gender

	Frequency	%	Valid Percent	Cumulative Percent
Valid Male	7	23.3	23.3	23.3
Female	23	76.7	76.7	100.0
Total	30	100.0	100.0	

The piechart-1 shows the percentage of dry eye in right eye among different age groups of patients having seborrhic blepharitis and seborrhic dermatitis. It is clearly evident here that dry among the patients of both SB and SD is frequent at the age of 20-25.

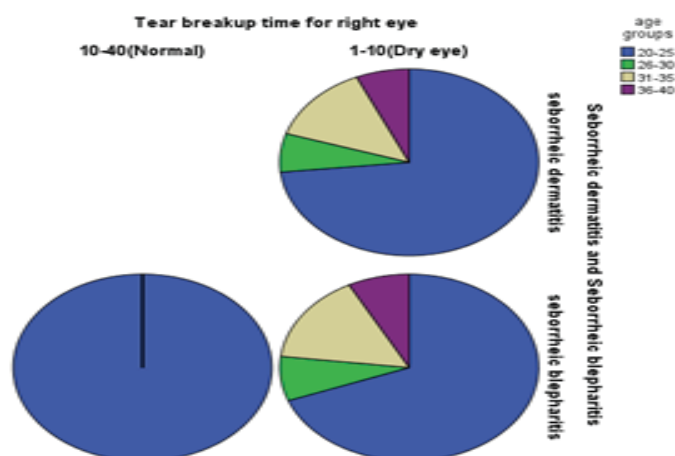


Chart-1 Incidence of dry eye in right eye according to age groups and diseases

The pie chart-2 below shows the percentage of dry eye in left eye among different age groups of patients having seborrheic blepharitis and seborrheic dermatitis. It is clearly evident here that dry among the patients of both SB and SD is frequent at the age of 20-25.

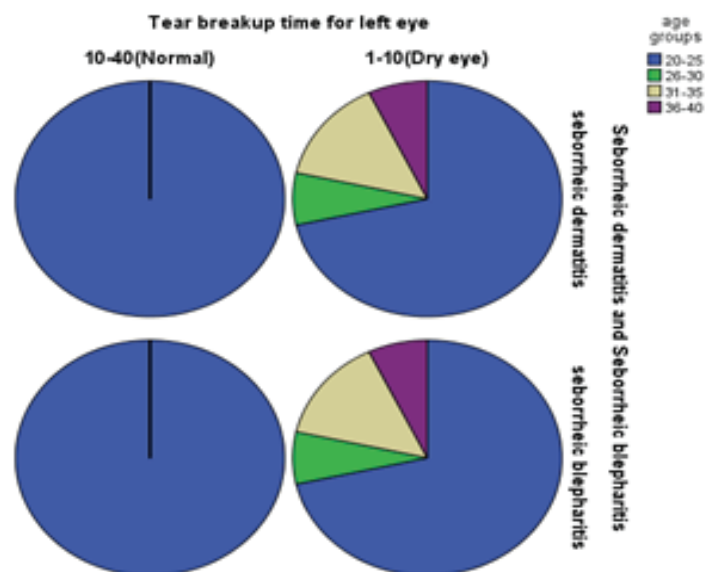


Chart-2 Incidence of dry eye in left eye according to age groups and diseases.

The main dry eye symptoms that these patients complaint of were:

- Itching
- Dryness
- Stinging/Burning
- Watering
- Photophobia

19 out of 30 patient’s complaint of these symptoms that was more prominent in right eye than left eye which constitutes about 63.3% of our sample size.

Table-3 Incidence of dry eye among the tested patients.

Disease:	SB(n=15)	SD(n=15)
Dry eye	Right: 13	Right: 15
	Left: 10	Left: 14

It shows us that 13 out of 15 patients of SB were having dry eye in right eye and 10 were having dry eye in left eye. In patients of adult SD all 15 had dry eye in right eye whereas 14 had dry eye in left eye.

DISCUSSION

It has been explained thoroughly from our study that there is a strong association of dry eye with Seborrheic Dermatitis and Seborrheic Blepharitis.

Previously a research was conducted on the associated conditions of SB which also showed that dry eye

affects 25-45% of patients with meibomian gland dysfunction and Seborrheic blepharitis, which is due to irregularity in the lipid layer of tear film and can lead to evaporation of tears or dry eye. The dry eye symptoms of SB patients include itching, burning and photophobia. The same study also revealed that there are some dermatological conditions that are linked with SB which includes Seborrheic Dermatitis mainly and showed that SD is found to occur in 95% patients of SB. Therefore this study proved that there is strong relation between SB and SD (8).

In our study, 16 out of 30 patients were having both SB and SD at the same time which makes about 53.3% of our sample. Therefore our study also showed a significant relationship between SB and SD. The main dry eye symptoms that our diagnosed patients complaint of were watering, itching, dryness and photophobia which are similar to the symptoms reported among the patients of SB in the above study. About 93.3% of our study sample had dry eye which strongly agrees with the statement in the above research showing the relationship of dry eye with SB and also proving SD as one of its skin association.

According to another research that was done on Seborrheic Blepharitis showed that out of 178 patients of SD only 2 didn’t have SB. 171 of these patients presented with the main symptoms of dry eye which were epiphora, photophobia, irritation, secretions and blurred vision. These patients also complaint of redness, itching, burning, fatigue after prolonged work and blurring of vision due to secretions (4).

Probability value for our study was (P<0.05). According to which the results for right eye were significant (0.002) but the results for left eye were not significant (1.00). 19 out of 30 patient’s dry eye symptoms were more prominent in right eye than left eye which constitutes about 63.3% of our sample size.

Our study also supported this research as it also showed that the dry eye symptoms are common among the patients of SB and SD. Our study also showed that almost 93.3% of patients diagnosed with SB and SD were having dry eye symptoms. These symptoms also include photophobia, tearing, burning and itching.

As our study is novel so very few articles were found related to our research topic. Our aim was to check that whether the patients with seborrheic dermatitis and seborrheic blepharitis are having dry eye or not because many patients take the extensive treatment for dry eye but their symptoms are not relieved as the main cause behind the dry eye is not treated. Patients are usually

unaware of this association, so our goal was to create awareness among the sufferers and it will also add up to the knowledge in medical field.

However there are certain limitations of our study. Majority of the patients above the age of 40 years had systemic diseases mainly hypertension and diabetes so it was in our exclusion criteria. We also excluded the patients of ocular pathology and cataract from our study as senile lenticular changes are more common in the individuals above 40 years so the age group that we included was 20 to 40. Moreover adult seborrheic dermatitis is also prevalent in the patients of this age group. Our sample was also small as Seborrheic dermatitis and Seborrheic blepharitis is reported largely in winter season but our research was conducted in spring-summer season.

Contact lens users and patients with fluorescein hypersensitivity were also excluded from our study. Hence it was quite challenging to collect the sample of such filtered patients; moreover the time duration for our study was also short.

CONCLUSION

This study was done to find out the association between dry eye and adult Seborrheic dermatitis and Seborrheic Blepharitis by using Tear break-up time test. The findings of the study concluded that there is strong association between dry eye, SB and adult SD however dry eye is more common among the patients who reported with certain ocular symptoms like itching, burning, watering and photophobia. So, our results suggested that TBUT of all the 30 tested patients is found to be lower in right eye as compared to left eye. These patients were also having ocular problems prominent in right eye. Moreover, the incidence of dry eye is more in female patients with its peak occurrence at the age of 20-25 years. On comparing the results of TBUT test for both SD and SB in both eyes of the tested patients, it was found that dry eye is seen in 29 out of 30 eyes in case of adult SD patients (n=15) while in case of Seborrheic Blepharitis (n=15) dry eye is seen in 23 out of 30 eyes. It gives us proof that dry eye is more frequent in the patients of Adult SD as compared to SB. Hence the results of our study goes in favor of our hypothesis that dry eye is seen markedly in the right eye of these patients of SD and SB because their right eye showed ocular symptoms at the percentage of 63.3%.

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Arooba Ehsan Awan and Irfa Nasir: Substantial contributions to the conception and design of the work.

Ummaya Ifhtikhar: Design of the work and the acquisition. Drafting the work.

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