



A Study of Correlation between Tear Film Break - Up Time (TBUT), Pterygium and Pinguicula on Patents Attending a Tertiary Centre, North Bengal Medical College & Hospital, Darjeeling, Sub Himalayan Region, India

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Abstract

Introduction: Degenerative changes in conjunctive are quite common in India, especially after 40 years of age. Degenerative changes like Pterygium and Pinguicula occurs especially due to prolonged exposure to ultra violet rays who lives in dry windy area and having pre-existing dry eye syndrome.

Pterygium is a elastotic degeneration of the subconjunctival tissue approaches towards the cornea in a triangular fashion. Pterygium is mostly prevalent on the palpebral aperture mostly in the nasal side. It is thought that the predominantly nasal location is related to reflection of light from the nasal bridge on to the nasal conjunctiva. The ultraviolet light may be mediated by mutation in the P⁵³ gene.

Pinguicula is also associated with prolong exposure to ultraviolet light, occur mostly to outdoor workers and those who live in tropical area near the equator.

Materials & Methods: A written consent of patients willing to be included in the study. The material needed are Whatman paper, Slit Lamp Bio microscope, Torch Lights, Snellen's chart, Near vision chart, etc.

The present institution based descriptive observational study conducted at the Department of Ophthalmology of North Bengal Medical College and Hospital, Darjeeling as OPD procedure. A total of 84 patients with unilateral Pterygium and Pinguicula devoid of any systemic diseases. A correlation with TBUT and prevalence of Pterygium and Pinguiculae were observed and documented.

Results: The study includes 84 patients with an mean age of 57 years. The mean TBUT was less in eyes of with Pterygium (8-9 Seconds) than in control eyes (14-16 Seconds). TBUT, less than 10 Seconds, considered as abnormal TBUT, was found in 36 eyes out of 84 eyes with Pterygium (42.86%), compared with 16 eyes out of 84 eyes with Pinguicula (19.05%) and 15 of 84 control eyes. A TBUT of less than 10 seconds (abnormal TBUT) was more significantly associated with eyes wise Pterygium compared to control eyes.

Conclusion: In this study we found that Pterygium is significantly associated with abnormalities of tear film, but not such with Pinguicula. TBUT may vary person to person according to prolong exposure to UV rays, occupations, geographic, and environmental factors.

Keywords: Tear film Break-Up Time (TBUT), Pterygium, Pinguicula.

Introduction

Pterygium is a elastotic degeneration of the subconjunctival tissue approaches towards the cornea in triangular fashion. Pterygium and Pinguicula are quite common in tropical and equatorial region, professionally who are outdoor workers due to prolong exposure to ultra violet rays. It has been studied that the UV rays causes disruptions of the integrity of tear film resulting into dryness of conjunctiva.

In Sub-Himalayan region, people very easily can be expose to ultra violet rays because of the geographical region. So, it is quite common to develop Pterygium as well as Pinguicula to people who are tea garden and outdoor workers. As the Sub-Himalayan region is quite windy, evaporation of tear film easily occurs, these also add o more prevalence of degenerative changes in the conjunctiva. Pterygium and Pinguicula are mostly common on the nasal side of the pal Preval aperture. It is said that as sun rays reached to the nasal breath and get reflected on the nasal side of the conjunctiva, so degenerative changes mostly changes on the nasal site(palpebral aperture). Aging pre-existing dry eye disease are also pre disposing factors for degenerative changes of conjunctiva. We assess the status of tear film with help of slip lamp, bio microscope, wat man filter paper. The tear film is examined with a broad beam and a cobalt blue filter. After an interval of time, black spots ot lines indicating the formation of dry areas appear. The Tear film Break Up Time (TBUT) is the interval between the last blink and the appearance of the first randomly distributed dry spot. A TBUT less than 10 Secs is considered abnormal. Shairmer test ids dome as follows:

- a) The eye is gently dried.
- b) The filter paper is folded 5mm from one end inserted at the junction of the middle and outer third of the lower lids.
- c) The patient is asked to keep the eyes opened and blink as necessary.
- d) After 5 minute the filter paper is removed and the amount of waiting is measured.

The normal result is over 15mm without tropical anesthesia, between 5-10mm is

borderline and less than 5mm indicates impaired secretion.

The pre-corneal tear film consist of three layers – (a)Lipid (b)Aqueous and (c)Mucin. The outer most layer Lipid layer is secreted by meibomian gland and glands of zeis that prevents evaporation of the aqueous layer of the tear film.

The middle layer, aqueous is secreted by the lacrimal gland, it helps to supply atmospheric oxygen to the avascular corneal epithelium. It also helps antibacterial properties, abolish any minute irregularities of the anterior surface and wash away the bridge.

The inner mucin layer is secreted by the conjunctival goblet, the crypts of Henly and glands of manz, converse the corneal epithelium from hydrophilic surface to hydrophobic surface so that it can be weighted by the aqueous component of the tear film.

A) Pterygium



B) Pinguicula



Study Materials

- Written consent for the patients willing to be included in the study.
- Whatman paper
- Slit Lamp Biomicroscope
 - Torch Lights
- Snellen chart to document distant vision.
- Near Vision Chart

Methodology

Period of data collections – May 2022 to December 2022.

Site of data collection – Eye OPD of North Bengal Medical College and Hospital, Darjeeling, West Bengal

Schedule of data collection – From 10 AM to 2 PM on three days in a week – Monday, Wednesday and Friday.

Tear film Break-Up Time (TBUT) test introduced by NORN is an excellent diagnostic test for detecting the mucin and lipid layer deficiency of the tear film (TF). Schirmer's Test helps to detect instability of the aqueous phase of the tear film. Few studies from India have found abnormalities of the tear film in eyes with Pterygium and Pinguecula.

This case-controlled study included 84 patients attending Out Patient Door(OPD) of the Department of Ophthalmology, North Bengal Medical College & Hospital, Darjeeling, West Bengal. Patients with unilateral Pterygium and lack of any systemic diseases were included in the study. The other eye of the patient was taken as control. Patient with recurrent Pterygium, systemic diseases/syndromes associated with dry eye (e.g Sjogren's syndrome), patient on medications that leads to ocular dryness, contact lens users, patient having adnexal disease, anterior or posterior segment disease which alters tear secretion and stability, patient having recent cataract surgery and patients on topical anti glaucoma medications were excluded from the study.

All the patients were subjected to detailed history taking with special attention to ocular dryness

symptoms such as itching, burning sensation, watering and discharge. The patients were subjected to a routine general physical examination and a detailed ophthalmic examination, examination with slit lamp bio microscope was done to examine the anterior segment of the eye and to note the size of Pterygium. TBUT measurement with fluorescein strip was performed without topical anesthesia, on patients with Pterygium or Pinguecula. TBUT is the interval between the last blink and the appearance of dry spot observed under slit lamp Bio microscope. Three readings were taken and the mean value of the measurement was documented. A TBUT less than 10 seconds is considered as abnormal.

The Schirmer's Test was carried out without topical anesthesia bilaterally with the help of Whatman's paper. The wet length of the strip was measured after 5 minutes. Readings were recorded in millimeters of wet strip. A Schirmer's Test of less than 10mm was considered abnormal. For this test, the Whatman's paper was placed on the junction of medial Two-Third and lateral One-Third of lower eye lid. TBUT was measured in 84 eyes with Pterygium and Pinguecula. TBUT with less than 10 seconds is considered as abnormal TBUT.

Results

The study includes 84 patients with an mean age of 57 years. The mean TBUT was less in eyes of with Pterygium (8-9 Seconds) than in control eyes (14-16 Seconds). TBUT, less than 10 Seconds, considered as abnormal TBUT, was found in 36 eyes out of 84 eyes with Pterygium (42.86%), compared with 16 eyes out of 84 eyes with Pinguecula (19.05%) and 15 of 84 control eyes. A TBUT of less than 10 seconds (abnormal TBUT) was more significantly associated with eyes wise Pterygium compared to control eyes. A TBUT less than 10 seconds (unstable tear film) was found in 18 eyes (20.93%) with Pterygium, compared to 75 (91.46%) eyes with Pinguecula and 4(4.87%) in control eyes. Unstable tear film

was significantly associated with eyes with Pterygium (P = 0.0027)

Conclusion

In this study we found that Pterygium is significantly associated with abnormalities of tear film, but not such with Pinguicula. TBUT may vary person to person according to prolong exposure to UV rays, occupations, geographic, and environmental factors.

Conflict of Interest - None to declare

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