

Correlation between Pterygium and Dry Eye: A Clinical StudyChandni Karole¹, Manoj Balke², Anjali Dadu³¹Associate Professor & HOD, Department of Ophthalmology, N.S.C. Government Medical College, Khandwa, Madhya Pradesh, India²Assistant Professor, Department of Ophthalmology, N. S. C. Government Medical College, Khandwa, Madhya Pradesh, India³Senior Resident, Department of Ophthalmology, N.S.C. Government Medical College, Khandwa, Madhya Pradesh, India

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Conflict of interest: Nil

Abstract:**Purpose:** Correlation between pterygium and dry eye: A clinical study.**Materials & Methods:** 200 patients with unilateral pterygium who attended ophthalmology outpatient department at Nandkumar Singh Chauhan Government Medical College, East Nimar (Madhya Pradesh) during a period of 3 months were included in the study. All selected patient underwent anterior segment & slit lamp examination for tear film break up time, marginal tear meniscus height, Schirmer's test-1 and 2. Test results were compared in pterygium eye (case) and contralateral normal eye (control) of the same patient. Data was entered in Microsoft Excel and SPSS was used for statistical analysis.**Results:** Numbers of patient taken for this study were 200 aged 20 to 80yr. Mean \pm SD of Schirmer test 1 in cases eye is 20.28 ± 11.41 and in controls eye 24.18 ± 9.69 a Mean \pm SD of Schirmer test 2 in cases eye is 14.04 ± 9.21 and in controls eye 17.08 ± 8.73 . Tear film break up time ≤ 10 seconds found in 56.6% cases eye and 43.4% control eyes, >10 seconds found in 48.8% cases eye and 51.2% control eyes. Marginal tear meniscus height is ≤ 0.2 mm found in 144 cases eye and 136 control eyes and it is >0.2 mm found in 56 cases eyes and 64 control eyes. Marginal tear meniscus height, tear film break up time and schirmer tests showed significant relation between grade 2 and 3 pterygium with dry eye.**Conclusion:** There is a significant correlation between pterygium and dry eye. As pterygium progresses it leads to abnormal tear film and dry eye.**Keywords:** Pterygium; dry eye; Schirmer's test; Tear film break up time test.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Pterygium is one of the common disorders of the ocular surface. Pterygium is "wing" shaped growth of the limbal conjunctiva within the palpebral fissure which is progressive and involves the cornea. The lesion occurs frequently at the nasal limbus than the temporal [1]. The etiology of pterygium is highly correlated with UV rays exposure, dry and hot climate and pollution [1]. Prevalence of pterygium $25.3 \pm 2.1\%$ in the age group of 70–79 years but incidences also increased from $6.7 \pm 0.8\%$ in the age group from 30–39 years due to environmental factors. Dry eye become very common nowadays, it is a multifactorial disorder of the tear film and ocular surface disorder [3]. Dry eye presents as visual Disturbance, ocular discomfort and tear film instability with potential damage to the ocular surface[4]. There might be a correlation between abnormalities in the tear film layer stability and development of pterygium [5]. While there is mechanism of the inflammatory

basis of dry eye syndrome that suggest an indirect effect on inflammatory mediators in pterygium [3]. The purpose of this study is to evaluate dry eye with unilateral pterygium.

Material and Methods

This was cross sectional study conducted in Ophthalmology outpatient department of Nandkumar Singh Chauhan Government Medical College, East Nimar (M.P.) during a period of 3 months. Two hundred patients with unilateral pterygium selected who attended ophthalmology outpatient department were included after written and informed consent in this study. Eye with pterygium taken as case and healthy eye as control. Exclusion criteria were patients who were not willing for consent and discomfort with the procedures and patients with primary and secondary Sjogrens syndrome, patients with previously diagnosed ocular diseases other than pterygium.

After Informed consent, detailed history included - Age, sex, occupation, duration of growth of pterygium, history of exposure to sunlight were noted.

All selected patients with unilateral pterygium underwent visual acuity assessment by snellens chart, standard ophthalmological examination by slit-lamp biomicroscopy to exclude the ocular or extraocular disorder other than pterygium that could affect tear film stability eg. blepharitis, allergy conjunctivitis, meibomitis, thyroid eye diseases, lacrimal system disorder, and use of any topical or systemic drug which causes dry eye. The presence of fibrovascular growth of tissue extending from the bulbar conjunctiva onto the cornea either nasally or temporally was termed as pterygium that graded according to the "Clinical classification" in grade 1 pterygium midway between limbus and pupil border, when it extends up to pupil border is Grade 2, and in grade 3 it Crosses pupil [3]. Tear film stability and its secretion were evaluated in both the eyes of patients with unilateral pterygium by performing the following tests.

Schirmers test was done in all patients by using what man filter paper which is 5mm wide and 35mm long. Schirmer 1-The test was performed without topical Anaesthetic which measured basic and reflex secretion and schirmer 2 with topical anaesthetic measured basic secretion. When reading is less than 15 mm in Schirmer 1 and less than 5mm in Schirmer 2 it indicated dry eye.

Tear meniscus height: Examination of inferior marginal tear meniscus height with slit lamp biomicroscopy was done in both the eyes of all patients, dry eye considered when tear meniscus height is <0.25 mm.

Tear break up time test (TBUT): Tear film breakup used to assess the status of precorneal tear film in dry eye individual. The tear film breakup time defined as the interval between last blink and the appearance of first dry spot. A tear break up time of less than 10 seconds considered abnormal.

The following procedures conducted in all the pterygium patients and to evaluate dry eye and data recorded. Data were analyzed by using SPSS software.

Result

Table 1: Schirmer Test 1 And 2 in 400 Eyes, 200 Cases Eye and 200 Control Eyes

	Cases Eye (n=200)	Control Eye (n=200)	Total (N=400 eyes)	P value
	Mean ± SD	Mean ± SD	Mean ± SD	
Schirmer 1	20.28 ± 11.41	24.18 ± 9.69	22.23 ± 10.75	0.000*
Schirmer 2	14.04 ± 9.21	17.08 ± 8.73	15.56 ± 9.09	0.001*

Table 2: Tear Breakup Test and Meniscus Height in Cases and Control

		Cases Eye	Control Eye	Total	P Value
		n =200 (%)	n=200 (%)	N=400 Eye	
TBUT of Cases	<10	120 (56.6)	92 (43.4)	212	0.000*
	>10	80 (48.8)	84 (51.2)	164	
	10	0 (0.0)	6 (100.0)	24	
Meniscus Height of Cases	<0.2	136 (55.7)	108 (44.3)	244	0.001*
	>0.2	56 (46.7)	64 (53.3)	120	
	0.2	8 (22.2)	28 (77.8)	36	

Table 3: Schirmer 1 and Schirmer 2 Test in 200 Cases Eye of Grade 1, Grade 2 and Grade 3 Pterygium

Test	Grade 1 (n=116)	Grade 2 (n=68)	Grade 3 (n=16)	F test	P value
Schirmer 1	24.55 ± 11.31	15.17 ± 9.36	11.0 ± 1.78	25.12	0.000*
Schirmer 2	17.41 ± 9.74	9.94 ± 6.32	7.00 ± 1.93	23.49	0.000*

Table 4: Meniscus Height in 200 Cases Eye of Grade 1, Grade 2 and Grade 3 Pterygium.

Meniscus Height of Cases	Grade 1(n=116)	Grade 2(n=68)	Grade 3 (n= 16)	Total N=200	P value
<0.2	56 (41.2%)	64 (47.1%)	16 (11.8%)	136	0.000*
>0.2	52 (92.9%)	4 (7.1%)	0 (0.0)	56	
0.2	8 (100.0%)	0 (0.0)	0 (0.0)	8	

Table 5: Tear Breakup Test in 200 Cases Eye Of grade 1, Grade 2 and Grade 3 Pterygium

TBUT of cases	Grade 1 (n=116)	Grade 2 (n=68)	Grade 3 (n=16)	F test	P value
<10	48 (40.0)	56 (46.7)	16 (13.3)	120	0.000*
>10	68 (85.0)	12 (15.0)	0 (0.0)	80	

Discussion

A study conducted at Nandkumar Singh Chauhan Government Medical College, Khandwa (East Nimar) in 200 patients. In these study 200 patients with unilateral pterygium aged 20 to 80 years with mean aged 50 years included, in 200 patients 200 eyes with pterygium taken as cases and fellow eye as control.

Many studies conducted on pterygium which showed a strong positive correlation between atmospheric factors eg. Dry and hot climate, UV radiation and the prevalence of pterygium [6,7,8]. There were 200 patients with unilateral pterygium, out of the 200 patients 116 patients had Grade 1, 68 patients had Grade 2 and 16 patients had grade 3 pterygium.

The mean standard deviations of Schirmer 1 in cases eye were 20.28 ± 11.41 and 24.18 ± 9.69 in control eyes and in Schirmer 2 test mean standard deviations were 14.04 ± 9.21 in cases eye and 17.08 ± 8.73 in control eyes respectively. Schirmer test mean standard deviation in grade 1 pterygium were 24.55 ± 11.31 , 15.17 ± 9.36 in grades 2, 11.0 ± 1.78 in grade 3 pterygium (F test -25.12, P value-0.000). Schirmer test concluded that the values significantly reduced in cases of grade 2 and 3 pterygium indicating the instability of tear film in pterygium patients.

The tear breakup time in pterygium eyes(200 eyes), <10 seconds in 120 eyes (56.6%) and >10 seconds in 80 eyes(48.8%) and control eyes < 10 seconds in 92 eyes(43.4%), >10 seconds in 84 eyes(51.2%) and 10 seconds in 6 eyes.

This test conducted that the tear breakup time significantly affects the pterygium patients. Marginal tear meniscus height measurement done by slit lamp biomicroscopy examination in pterygium eyes and the control eyes. Decreased marginal tear meniscus height (<0.2 mm) among the pterygium eyes was observed in 136 eyes and > 0.2 mm observed in 56 eyes of pterygium patients and 0.2 mm in 8 eyes of pterygium patients. Marginal tear meniscus height of pterygium eye was statistically significant (p value=000). These tests concluded that there is a correlation between pterygium and unstable tear film.

Conclusion

There was a significant correlation between dry eye and pterygium. On comparison of pterygium eye with fellow eye, Odd's Ratio was showing that pterygium increases the risk of dry eye in pterygium patients; mostly it affects grade 2 and grade 3 pterygium. As the pterygium progresses it leads to tear film instability and development of dry eye. This study has demonstrated that there is a positive strong correlation between dry eye and pterygium. Patients with tear film instability are more susceptible to the damaging effects of UV rays in the sunlight. UV radiation is one of the major risk factor for pterygium development. Therefore dry eye workup should also be done in pterygium patients.

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