

Relation of Pterygium and Ocular Dominance

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ABSTRACT

Objective: The aim of this study is to evaluate the relation between pterygium and ocular dominance.

Method: In this cross-sectional study a total of 58 patients who had unilaterally pterygium and 60 healthy participants without pterygium were enrolled. Patients' dominant eyes were been determined by using Dolman's method (hole-in-the-card test). Clinical and demographic features (such as age, gender) of the patients were noted. Snellen's best corrected visual acuity, slit lamp biomicroscopic examination were evaluated. Any association with pterygium side and dominant eye side was investigated.

Results: The mean age of the 58 patients suffered from pterygium (34 M, 24 F) was 45.7 ± 12.2 years. Forty four patients' right eye (75.9 %) and 14 patients' left eye (24.1%) were dominant in patients with pterygium. Twenty seven of 44 right eye dominant patients had pterygium at their right eye (61%) and 10 of 14 left eye dominant patients had pterygium at their left eye (71%). There was a significant relation between dominant eye and pterygium side ($\Phi = 0.281$ and $p = 0.032$).

Conclusions: In participants of both with or without pterygium, right eye seems to be dominant more frequently. Moreover, pterygium is more frequently occurs in the dominant eyes.

Keywords: Dolman's method, ocular dominance, pterygium

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INTRODUCTION

Pterygium is an ocular surface disease that can cause severe ocular irritation, hyperemia, cosmetic problems and, visual impairment due to induced astigmatism (1, 2). Since all these representation, pterygium sometimes requires surgery (3). Risk factors that contributes to development of pterygium is controversial. There are many different reports that attributes gender, alcohol, smoking, age and ethnicity as a risk factor (4–8). However, ultraviolet exposure is being acknowledged main causative factor that results in production of p53, proinflammatory cytokines and matrix metalloproteases (9, 10).

Ocular dominance is described as a tendency to prefer visual input from one eye which is suggested that the dominant eye sustains a better fixation and perceptive function (11). Dominant eye is used when looking at a keyhole or taking aim with a gun. Since dominant eye is more exposed to environmental conditions that damage the eye, in dominant eye occurs much more pterygium (12). Until now, there are limited reports that was evaluated the association between pterygium and dominant eye (12). Therefore, the purpose of this study was to evaluate the association with pterygium and dominant eye.

METHODOLOGY

Study Design

This study was designed as descriptive and cross-sectional. Fifty eight patients with unilateral pterygium and 60 normal controls were enrolled in this study. All patients were examined due to determine their dominant eye. The association with pterygium and dominant eye was investigated.

This study protocol was approved by the Local Ethics Committee and detailed written informed consent form was obtained from all patients.

Participants

Fifty eight patients with unilateral pterygium and 60 control patients without pterygium who were admitted to Adana Numune Training and Research Hospital between January 2014 and April 2014 were included in this study. Inclusion criteria were; patients with unilateral pterygium, absence of any retina pathology, participants whose measured Snellen's best corrected visual acuity (BCVA) is better than 20/28.5 bilaterally. Exclusion criteria were; any retinal pathology and patients whose measured Snellen's BCVA is worse than 20/28.5 bilaterally.

Data collection

Clinical and demographic features (such as age, gender) of the patients were noted. Snellen's best corrected visual acuity, slit lamp biomicroscopy examination, and fundus examination were evaluated. Pterygium side was noted. Dolman's method (hole-in-the-card test) was used to determine the dominant eye in this study. This test is performed by using a 25×15 cm card with a centered 3 cm diameter hole. This test is performed with this method that; in summary; patients hold the aforementioned card using both hands and asked to view a six meter distance target; thereafter patients moves the card closer toward his/her face without losing the target, until the 3 cm diameter hole covers his/her eye. This test was repeated many times. If the test illustrated the same result, mentioned eye was accepted to be dominant eye.

Distribution of dominant eye in pterygium group and control group were noted and association with pterygium and dominant eye were evaluated.

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Statistical analysis

All the data were analysed using SPSS 11.5 package programme. Data were expressed as mean \pm standard deviation. All the data has normal distribution. Mean ages and gender distribution difference between two groups was evaluated using Student's *t*-test. Pearson's Ki-Square test was used for nominal variables. The association between dominant eye and pterygium side was investigated by calculating Phi quotient. Statistical significance was set at $p < 0.05$.

RESULTS

A total of 58 patients (34M, 24F) suffer from pterygium and 60 (38M, 22F) control patients without pterygium were included in this study. Demographic features are summarized in Table 1. There was no statistically significant difference between two groups when evaluated gender and age distribution ($p = 0.368$ and $p = 0.338$, respectively).

Table: 1. demonstrates demographic features of all patients.

	Pterygium group (n = 58)	Control group (n = 60)
Gender n, (%)		
Female	24(41.4)	22 (37.7)
Male	34 (58.6)	38 (63.3)
Age	45.7 \pm 12.2	46.2 \pm 11.9
Age range	70 (18 – 80)	71 (19–82)

Forty four patients' right eye (75.9 %) and 14 patients' left eye (24.1%) were dominant in patients with pterygium. Forty seven patients were (78.3%) right-eye and 13 (21.7%) patients

were left-eye dominant in control group. There was no statistically significant difference at distribution of dominant eye between two groups ($p = 0.460$).

In pterygium group ($n = 58$); 31 (53.4%) patients had a pterygium in their right eye and 27 (46.6%) patients had a pterygium in their left eye. Twenty seven (61.4%) of 44 right-eye dominant patients had a pterygium in their right eyes (Table 2). Ten (71.4%) of 14 left-eye dominant patients had a pterygium in their left eyes. There was a directly association with dominant eye and pterygium ($\Phi = 0.281, p = 0.032$).

Table 2: Illustrates distrubition of eyes with pterygium and dominant eyes.

Eye with pterygium n, (%)	Dominant eye		Total
	R	L	
R	27 (61.4)	4 (28.6)	31 (53.4)
L	17 (38.6)	10 (71.4)	27 (46.6)
Total	44 (75.9)	14 (24.1)	58 (100)

* $\Phi = 0.281, p = 0.032$ Pearson's Chi-squared test (R: Right, L: Left)

DISCUSSION

Forsius *et al* (13) reported that pinguecula and pterygium is more likely seen in out-of-doors working people in 1963. Ever since the first demonstration of ultraviolet as a risk factor for pterygium by Cameron *et al* (14), so many researches supported this finding (1–4, 9).

Jensen *et al* reported that when asked 17 patients to close both eyes and then make them to open just one eye, participants preferred to open their dominant eyes which were determined by using Parson and Mile's manoptoscope test previously. When the same patients asked to close just one eye, they preferred to close their non-dominant eyes. Moreover, Jensen *et al* reported that when the patients turned his or her face towards the sun, subjects closed their non-dominant eyes (12). At this point, these results indicate that dominant eye is more likely to expose sun light and poor environmental conditions.

In this study, we aimed to investigate if there is a relation between dominant eye and pterygium, to the best of our knowledge; this is the most extensive study in the literature. We have found a tendency to develop pterygium in dominant eyes. However, the same tendency did not shown in eyes with pterygium. In other words; when 27 of 31 right eye with pterygium was identified as right dominant eye; left eye dominance advantage cannot be mentioned for the left eyes with pterygium. This can be described as the general right eye dominance excess (in this study 75.9%).

As regards the limitations of this study; its small sample size and not to investigate the risk factors for pterygium. In consideration of this study; it seems to be more exposure to the poor environmental conditions (ultraviolet, wind, dust *etc*) in dominant eyes. Since this effect, pterygium seems to occur more frequently in dominant eyes. Further studies with more sample size, taking into account risk factor analyses are needed.

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