

A Hospital-based Clinical Study on Risk Factors of Pterygium

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Abstract

Background: Pterygium is a common ophthalmological disease seen in day-to-day practice. Many factors play their role individually and collectively in causing pterygium. The present study analyses the different risk factors in patients attending a tertiary teaching hospital.

Aim of the Study: This study aims to determine the risk factors associated with pterygium through history taking and examination findings.

Materials and Methods: A total of 46 patients with pterygium were included in the study excluding other systemic and local diseases producing dry eye. Thorough clinical and ophthalmology examination was done to know the risk factors contributing to pterygium. The breadth and pterygium on long axis was measured.

Observation and Results: Among the 46 patients, there were 35 (76.08%) males and 11 (23.91%) females with a male-to-female ratio of 3.18:1. The age of the patients was from 23 to 67 years with a mean age of 49.63 ± 3.72 . Exposure to dust, hot, and dry atmosphere was in 34 (73.91%) patients. Exposure to toxic fumes and other irritating substances was observed in 29 (63.04%). 30 (65.21%) patients were working in outdoors when compared to 16 (34.78%) patients in indoors in this study. Xerophthalmia was reported by 22 (47.82%) of the patients in this study.

Conclusions: Even though the risk factors of pterygium identified in the study are outdoor exposure to ultraviolet light, toxic fumes, dust, and dry hot weather conditions. The examination findings point toward the presence of multiple associations simultaneously in most of the patients, and this overlap of associations indicates several factors operating together to cause pterygium and not a single factor.

Key words: Conjunctiva, Cornea, Exposure, Pterygium

INTRODUCTION

Pterygium is a slow-growing proliferation of wing-shaped fibrovascular tissue that encroaches on the cornea. It arises from the conjunctiva,^[1] subconjunctival connective tissue,^[2] or from the limbal epithelial basal cells.^[3] The prevalence of pterygium ranges from 0.7% to 31% in various studies around the world.^[4] Earlier it was thought to be simply a degenerative process arising from pinguecula.^[5] However, recently, reports have proved that pterygium is an active,

invasive, and inflammatory process associated with cellular proliferation, connective tissue remodeling, and angiogenesis leading to fibrovascular proliferation.^[6] It can harbor malignancies such as squamous cell carcinoma^[7] or malignant melanoma^[6] which may become threat to the life. The risk factors described in the literature are exposure to dry, dusty, sunny, arid, and humid atmosphere of tropic and sub-tropical atmosphere.^[8] The main symptoms are discomfort and watering of the eyes. It may progress to involve the cornea resulting in blindness. Pterygium formation was linked to corneal and conjunctival microtrauma caused by exposure to sunlight and particulate matter such as dust particles. Several modalities of surgical treatment have been advocated, but the recurrence rate remains high.^[9,10]

Although the anti-inflammatory drugs and lubricants minimize the patient's discomfort, it cannot cure it. Surgical

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removal is the treatment of choice.^[11] Methods of pterygium excision by bare sclera technique or McReynolds operation were associated with high recurrence. Adjunct therapies such as β -radiation, thiotepa, 5-FU, and mitomycin C remain controversial.^[12] Autologous conjunctival grafting is reported to be the best method, giving both low recurrence rate and few complications. The present study was conducted to determine the risk factors associated with pterygium.

Study Period

The period of study was from March 2002 to February 2004 (2 years).

Institution of Study

The study was conducted at GGH, Kurnool Medical College, Kurnool, Andhra Pradesh.

MATERIALS AND METHODS

A total of 46 patients attending the Department of Ophthalmology of Tertiary Teaching Hospital were included in this study. The Institutional Ethical Committee clearance was obtained and informed consent approved by the committee was obtained from the patients. Inclusion criteria: (1) Patients with pterygium aged between 20 and 70 years are included and (2) Patients with complaints of dry eye and tearing of eye with pterygium were included. Exclusion criteria: (1) Patients aged below 20 years and above 70 years were excluded, (2) Patients with primary and secondary Sjogren's syndrome were excluded, (3) Patients with other diseases causing dry eye were excluded, (4) Patients with inclusion cysts in pterygium were excluded, and (5) Patients with recurrence pterygium following surgery were excluded. A thorough clinical history taking was done. Patients were subjected to thorough ophthalmological examination to exclude other diseases of the eye affecting the tear film formation and function such as local ocular allergy, systemic allergy, endocrinal disorders, blepharitis, lacrimal apparatus blocks, drugs used locally for other diseases, and systemic collagen disorders. Demographic details of the subjects were collected. Risk factors of pterygium such as history of exposure to sunlight, duration of work in the outfields, exposure to toxic fumes, and working in cotton industry were observed. Slit lamp examination, visual acuity tests funduscopy were undertaken in all the patients. In relation to the actual pterygium; the side of involvement, size, nasal, or temporal disposition of the pterygium were noted. The extent of pterygium onto the cornea and breadth of it surrounding the cornea was recorded in millimeters. All the data were analyzed using standard statistical methods.

OBSERVATIONS AND RESULTS

Among the 46 patients, there were 35 (76.08%) males and 11 (23.91%) females with a male-to-female ratio of 3.18:1. The age of the patients was from 23 to 67 years with a mean age of 49.63 ± 3.72 . The incidence of pterygium was found in 22 (47.82%) patients and they belonged to the age group of 40–60 years [Table 1].

Among the 46 patients, exposure to dust, hot, and dry atmosphere was found in 34 (73.91%) patients. History of family members with pterygium was observed in 05 (10.86%) of the patients. A patient with a history of exposure to toxic fumes and other irritating substances was observed in 29 (63.04%) of the patients. 30 (65.21%) patients were working in outdoors when compared to 16 (34.78%) patients in this study. Xerophthalmia was reported by 22 (47.82%) of the patients in this study. In the present study, the risk factors identified were hot and dry weather conditions, exposure to chemical fumes, dust, and cotton fibers. The other factor was dry eye. 30 (65.21%) patients were working in outdoors when compared to 16 (34.78%) patients with a ratio of 1.8:1 in this study [Table 2].

Among the 46 patients, 21 (45.65%) patients had pterygium in the right eye, 19 (41.30%) in the left eye, and 06 (13.04%) had in both eyes. Patients with nasal side involvement

Table 1: Showing the age and gender incidence of the study group (n=46)

Age groups (years)	Male-35	Female-11	Percentage
20–30	06	03	19.56
30–40	08	02	21.73
40–50	09	06	32.60
50–60	07	00	15.21
60–70	05	00	10.86

Table 2: The risk factors elicited on history (n=46)

Observations	n (%)
Atmospheric conditions	
Hot and dry	34 (73.91)
Cold and humid	12 (26.08)
Exposure to toxic fumes-29	
Chemicals	12 (26.08)
Cotton fibers	14 (30.43)
Asbestos dust	03 (06.52)
Family history	
Yes	05 (10.86)
No	41 (89.13)
Dry eye	22 (47.82)
Type of work	
Outdoor	30 (65.21)
Indoor	16 (34.78)

were 33 (71.73%) and temporal side 13 (28.26%). Among 46 patients, 16 (38.78%) had Grade 1, 21 (45.65%) had Grade 2, and 09 (19.56%) had Grade 3 pterygium. The mean breadth of the pterygium at corneal limbus was 57 ± 0.72 mm. The encroachment of pterygium onto the cornea was measured from limbus to apex of pterygium on a horizontal axis. The mean horizontal (encroachment) size of pterygium was 2.2 ± 0.24 [Table 3].

DISCUSSION

A total of 46 patients were included in the present study. Males were 35 (76.08%) and females were 11 (23.91%). The age of the patients was from 23 to 67 years with a mean age of 49.63 ± 3.72 . In a similar study by Antony *et al.*,^[13] the age range was 22–77 years with a mean age of 51.5 years; 59 men and 41 women. In another study by Kumar *et al.*,^[14] the mean age was 51.74 ± 13.65 and both sexes were equally involved. In this study, the incidence of pterygium was found in 31 (67.39%) patients and they belonged to the age group of 40–60 years. However, Rajiv *et al.*^[15] reported higher incidence in the age group of 30–40. Exposure to dust, hot, and dry atmosphere was found in 34 (73.91%) patients unlike in the study by Mackenzie *et al.*^[16] who reported an incidence of 86.63%. History of family members with pterygium was observed in 05 (10.86%) of the patients. In a similar study by Islam and Wagoner^[17] who reported an incidence of family history in 10 (34.31%) patients. Patients with a history of exposure to toxic fumes and other irritating substances were observed in 29 (63.04%) of the patients similar to the study by Kwon JS *et al.*^[16] reporting incidence in 63.25%. 30 (65.21%) patients were working in outdoors when compared to 16 (34.78%) patients in this study. Xerophthalmia was reported by 22 (47.82%) of the patients in this study. However, in a study by Rajiv *et al.*^[18] it was 29.67%. There are multiple factors collectively playing their role in the causation of pterygium such as inflammation,^[16] degenerative changes,^[19] neoplastic,^[20] and genetic^[16] factors.

Recent studies have shown that exposure to ultraviolet (UV) rays was the cause of pterygium.^[21,22] In the present study, the risk factors identified were hot and dry weather conditions, exposure to chemical fumes, dust, and cotton fibers. The other factor was dry eye. The present study has few limitations and does not confirm any association with other studies. It may be due to a comparatively clear weather conditions and with less dust pollution in Kerala. 30 (65.21%) patients were working in outdoors when compared to 16 (34.78%) patients with a ratio of 1.8:1 in this study. This finding is comparable to that of similar studies evaluating the relationship between outdoor work and pterygium conducted in different parts of the world.^[16] Among the 46 patients, 21 (45.65%) patients had pterygium in the right eye, 19 (41.30%) in the left eye, and 06 (13.04%) had in both eyes. Patients with nasal side involvement were 33 (71.73%) and temporal side 13 (28.26%). Previous studies have shown that pterygium occur predominantly at the nasal limbus, while temporal pterygium is less common and rarely found in isolation.^[23] Predilection for the medial limbus is explained by chronic focal UV damage to this region which activates limbal stem cells, leading to formation of a pterygium. Among 46 patients, 16 had Grade 1, (28.26%), 21 (45.65%) patients had Grade 2, and 09 patients (19.56%) had Grade 3 pterygium. The mean breadth of the pterygium at corneal limbus was 57 ± 0.72 mm. The encroachment of pterygium onto the cornea was measured from limbus to apex of pterygium on a horizontal axis. The mean horizontal (encroachment) size of pterygium was 2.2 ± 0.24 [Table 3].

CONCLUSIONS

Even though the risk factors of pterygium identified in the study are outdoor exposure to UV light, toxic fumes, dust, and dry hot weather conditions. The examination findings point toward the presence of multiple associations simultaneously in most of the patients, and this overlap of associations indicates several factors operating together to cause pterygium, not a single factor.

Table 3: Showing the examination findings of pterygium in the study subjects (n=46)

Examination findings	n (%)
Right eye	21 (45.65)
Left eye	19 (41.30)
Both eyes	06 (13.04)
Nasal	33 (71.73)
Temporal	13 (28.26)
Grade 1	16 (38.78)
Grade 2	21 (45.65)
Grade 3	09 (19.56)
Mean breadth of pterygium	5.7 ± 0.72
Mean horizontal encroachment	2.2 ± 0.24

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