Original Research Article

An analytical study on the epidemiology of pterygium in a tertiary care centre

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Abstract

Aim: To study and analyse the epidemiology of pterygium in a tertiary care centre. **Design:** Cross sectional observational study. **Materials and methods:** The patients more than 20 years of age, with true pterygium attending the outpatient clinic of Department of Ophthalmology of Coimbatore Medical College Hospital were included in the study. Data collection was done using a structured questionnaire which comprises of socio-demographic characteristics including age, sex, occupation and detailed history. The exact hours of sun exposure per day and the years of sun exposure were noted as well as any other ocular or systemic co morbid conditions like diabetes and hypertension. A complete ocular examination was done and recording of the uncorrected and best corrected visual acuity along with the degree of astigmatism was done with the help of automated keratometry. Tear film was assessed with Schirmer's test and tear film break-up time. **Results and conclusion:** Middle aged to elderly people were found to be more affected due to their prolonged exposure to inciting agents in the environment. There was no significant gender predilection, if the environmental factors are the same. Sunlight exposure was found to be a significant risk factor and dry eye played a contributory role. No co relation was found between development of pterygium and systemic diseases like diabetes and hypertension.

Key Word: true pterygium, sunlight, dry eye, astigmatism.

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INTRODUCTION

Pterygium is one of the common ocular conditions found in middle aged and elderly individuals. It is a benign, degenerative and proliferative condition of conjunctiva and subconjunctival tissue, with potential to cause visual disturbances[10]. It can be easily diagnosed and staged by clinical examination. The most important factor related to the development of pterygium is thought to be sunlight exposure[2,5]. Other contributing factors include dry eyes, smoking, prolonged outdoor activities, low socioeconomic status and high altitude[7]. Major complication is the obscuration of visual axis if it grows into the centre of the cornea. The development of irregular astigmatism due to flattening of the cornea in the horizontal meridian is another cause of decrease in vision[9]. Proper understanding of the epidemiology and risk factors of this condition is essential for planning appropriate measures to prevent its occurrence and thereby reducing the physical and financial burden to the society. This study aims to identify the risk factors of pterygium and specific associations and correlations if any.

MATERIALS AND METHODS

This cross-sectional observational study was done in patients more than 20 years of age, with true pterygium presenting to the outpatient clinic of Department of Ophthalmology, Coimbatore Medical College Hospital

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during the period of one year. A total of 104 patients were included in the study.

Criteria for patient selection were as follows:

Inclusion criteria

- People of age group >20 years
- True pterygium
- Patients with other comorbid conditions like diabetes and hypertension
- Patients with known dry eye syndrome

Exclusion criteria

- Pediatric patients
- Patients with fundus pathology
- Glaucoma patient
- Pseudopterygium
- Injuries of eye
- Suspected ocular surface squamous neoplasia
- The patients who had asymmetrical pterygium in both eyes

METHODOLOGY

After getting informed consent, data collection was done using a structured questionnaire which comprises of socio-demographic characteristics including age, sex, occupation and detailed history. The exact hours of sun exposure per day and the years of sun exposure were noted as well as any other ocular or systemic co morbid conditions like diabetes and hypertension. Patients were grouped into outdoor and indoor workers according to the nature of their occupation. They were categorized as rural and urban population depending on their hometown. Previous history of trauma, smoking habits and alcohol intake were also documented. For the purpose of analysis, the patients coming from areas which were higher than 1000 meters from the sea level were considered as high altitude and less than 1000 considered as low altitude. During symptoms assessment, care was taken to find out if patient had any dry eye symptoms like irritation and burning sensation. A complete ocular examination was done and recording of the uncorrected and best corrected visual acuity along with the degree of astigmatism was done with the help of automated keratometry. Astigmatism was recorded as with the rule, against the rule or oblique astigmatism. For the purpose of analysis pterygium was considered in one eye of bilateral cases. The asymmetric bilateral cases were excluded from the study. Detailed slit lamp examination to find the stage and measurement of the pterygium was done. It was classified as stage I- restricted to limbus, stage 2- marginally invade the cornea, stage 3- between limbus and pupillary margin and stage 4- central to the pupillary margin. Pterygium was classified as regressing, intermediate or fleshy pterygium according to Tan *et al* classification [1] according to the visibility of episcleral vessels. The recording of the position of pterygium was also done as nasal, temporal or double pterygium as well as whether the pterygium was unilateral or bilateral. The tear film assessment was done with the help of Schirmer's test and tear film break up time (TBUT). Data analysis was performed using statistical software package SPSS version 22.0. Both descriptive and inferential statistics were used. The comparison of continuous variable across different subgroups was done using ONE WAY ANOVA. The comparison of categorical and ordinal variables across different subgroups were done using chi square test. Correlation analysis was done by estimating Pearson estimation co-efficient. P value of less than 0.05 was considered significant.

RESULTS

Age of the patients ranged from 27 years to 78 years. The mean age of the study population is 51.5 years, the standard deviation being 13.5 years (Table 1). Majority of the patients belonged to the age group of 46- 55 (n=28, 26.92%). None of the patients were below 25 years of age. Females were more in the study group (n=70, 67%) (Table 2).Majority of patients were engaged in outdoor works (n=82, 9%) (Table 3).Most of the subjects were from low altitude areas (n=73, 70%) (Table 4).Pterygium was unilateral in 54 patients and bilateral in 50 (Table 5).In 43.27% of patients, pterygium was of the regressive type, which was the most common. The next common type was intermediate followed by fleshy type (Table 6). Mean sun exposure hours was 5.7 hours per day (SD.2.7hours), Mean years of sun exposure was 27.7 years (SD 11.7) (Table 8).The patients engaged in indoor working had less than 4 hours of sun xposure per day and those working outdoor had 4-9 hours of exposure per day.77.9 % (n=81) had significant sun exposure per day (>4 hours).63.5% (n=66) were exposed to long duration of sunlight for more than 20 years. Duration of sun exposure is not significantly different across types (Kruskal Wallis test, P = 0.087). But it is close to the significance (Table 9). Years of sun exposure is significantly higher in the fleshy type in comparison to regressive ($p<0.01$) and intermediate types ($P<0.01$) (One-way ANOVA overall, P = 0.0008) (Table 10) Proportion of the patients with dry eyes as a risk factor was not significantly different across the various types (Chi square test for trend P = 0.79) (Table 11 and Table 12) More number of patients were found to have with the rule astigmatism (Table 13).

Table 1: Age distribution of study participants

Sl No	Age group	Frequency	Percentage
1	26-35	15	14.42
2	36-45	22	21.15
3	46-55	28	26.92
4	56-65	21	20.19
5	>65	18	17.31
	Total	104	100.00

Figure 1: Age distribution

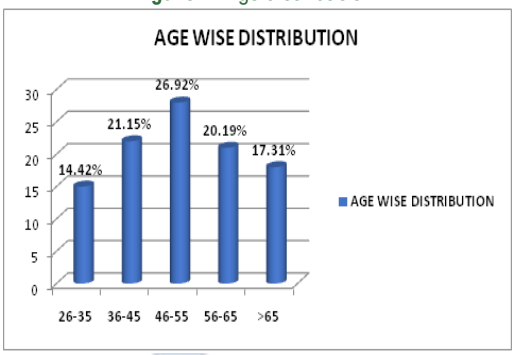

Table 2: Gender Distribution

Sl no	Sex	Frequency (n)	Percentage (%)
1	Male	34	33
2	Female	70	67
3	Total	104	100

Table 3: Occupation

Sl no	Occupation	Frequency (n)	Percentage (%)
1	Indoor	22	21
2	Outdoor	82	79
3	Total	104	100

Table 4: altitude

Sr no	Altitude	Frequency(n)	Percentage(%)
1	Low(1000 Meters)	73	70
2	High(>1000 meters)	31	30
3	Total	104	100

Table 5: Laterality of pterygium

Sl no	Laterality	Frequency	Percentage
1	Unilateral	54	51.9
2	Bilateral	50	48.1
3	Total	104	100

Table 6: Type of pterygium

Type of pterygium	Frequency	Percentage
Regressive	45	43.27
Intermediate	37	35.58
Fleshy	22	21.15
Total	104	100

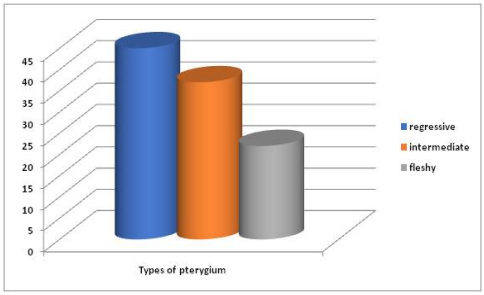

Figure 2: Type of pterygium

Table 7: Stage of pterygium

Stage	Frequency	Percentage
1	4	3.85
2	37	35.58
3	60	57.69
4	3	2.88
Total	104	100

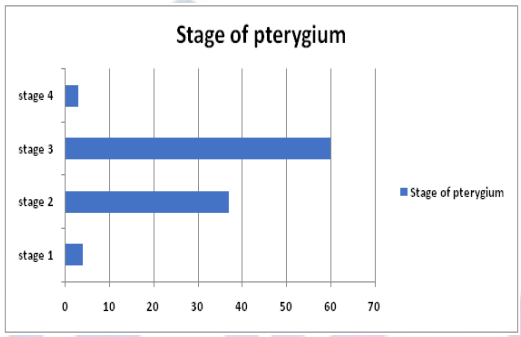

Figure 3: Stage of pterygium

Table 8: Duration of sun exposure

		Frequency	Percentage
Hours of sun exposure	<=4 hours per day	23	22.1
	>4 hours per day	81	77.9
Years of sun exposure	<=20 years	38	36.5
	>20 years	66	63.5

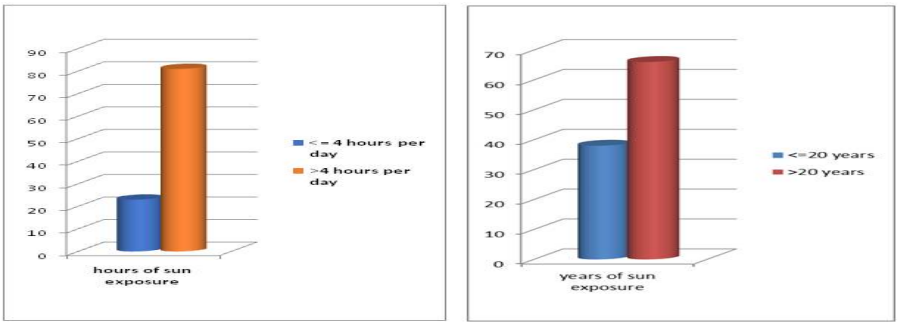

Figure 4: Duration of sun exposure

Table 9: Duration of sun exposure and type of pterygium

Type of Pterygium	Regressive	Intermediate	Fleshy
Sun exposure in hours (Median – IQR)	6 (6-7)	6 (2.5-7.5)	7 (6-8)

Table 10: Years of sun exposure and type of pterygium

Type of Pterygium	Regressive	Intermediate	Fleshy
Sun exposure in years (Mean ± SD)	24.38 ± 12.20	24.68 ± 8.94	34.77 ± 11.28**

Table 11: Dry eyes and type of Pterygium

Type of Pterygium	Regressive	Intermediate	Fleshy
Proportion of patients with dry eyes	7/45	10/37	2/22

Table 12: Dry eye

Sl no	Dry eye	Frequency	Percentage
1	No dry eye	85	81.73
2	Dry eye	19	18.27
3	Total	104	100

Table 13: Type of astigmatism

Sl no	Astigmatism type	Frequency	Percentage
1	No astigmatism	27	25.96
2	With the rule	40	38.46
3	Against the rule	11	10.58
4	Oblique	26	25.00

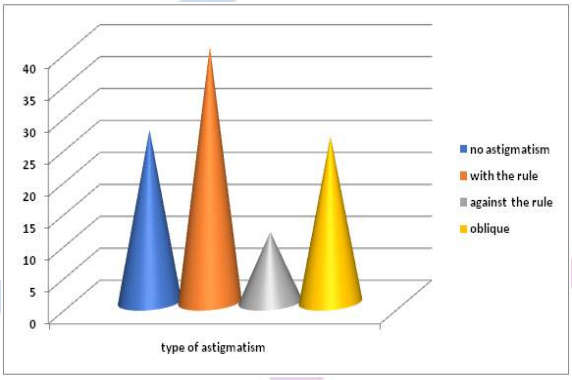

Figure 9: Type of astigmatism

DISCUSSION

Our study included 104 subjects who were diagnosed to have true pterygium in either or both of the eyes. The mean age of the patients in our study was 51.5 years with a standard deviation of 13.5 years, which is comparable to previous studies. Youngest patient was 27 years and the oldest 78 years. 15 patients (14.42%) were in the age group 26-35, 22 (21.15%) in the age group 36-45, 28(26.92%) in the age group 46-55, 21(20.19%) in the age group 56-65 and 18 (17.31%) in the age group >65 years, in our study. Majority of the patients presented in the age group of 45 to 55 years (n=28, 26.92%) Females were predominant in our population (n=70, 67%). Most of the previous studies have shown an increased incidence of pterygium in males, as men were commonly involved in outdoor works.[2] Our study population consisted of the people coming from low socioeconomic conditions who were ladies involved in outdoor occupation. This may account for the increased number of female pterygium cases in our study. The association of UV light with occurrence of pterygium is well documented in previous studies.[3,4,5]. Mean sun exposed hours were 5.7 hours per day with a standard deviation of 2.7 hours and mean year of sun exposure was 27.7 years with a standard deviation of 11.7 years. The average daily duration of sun exposure was not significantly different across types of pterygium (p=0.087). However, the years of sun exposure (p=0.008) and cumulative hours of sun exposure (p=0.002) were significantly higher in the fleshy type. Most of the patients in our study were from the rural area (n=74, 70.2%). Rural area and low socioeconomic status are associated with more amount of outdoor work and more UV exposure. These people will have low level of education and may not be aware of the harmful effects of the UV light and thus don't adopt protective measures such as hats and glasses. [6] It is well documented that people living in high altitude have higher chance developing pterygium because of the higher UV light

exposure along with dry eye.[7,8] In our study no significant association between high altitude and pterygium were found probably because of the low sample size. We could not find any significant association between diabetes (p=0.52) and hypertension (p=0.75) with the type of the pterygium, in our study. No such correlation was documented in other studies also. The diabetic patients have more chance of developing tear film instability thereby making the eye more vulnerable to UV damage. Dry eye was found to be present in 19 patients (18.27%). Even though dry eye may be a risk factor for pterygium, statistical correlation could not be established in our study due to the small sample size (p=0.79). Out of 104 patients 77 patients (74.04%) had astigmatism among which maximum were having with the rule astigmatism (n=40, 38.46%). This is in accordance with the other studies[9].

CONCLUSION

The objective of our study was to document the demography and clinical assessment of pterygium and to identify risk factors or associations, if any. The following conclusions were made. Middle aged to elderly people are more affected due to their prolonged exposure to inciting agents in the environment. There is no significant gender predilection, if the environmental factors are the same. UV exposure was a significant risk factor in the development of pterygium. Patients working outdoors should be counselled about the importance of wearing protective eye gears. It should be emphasized that such protective measures can not only delay the onset but also the progression of pterygium to some extent. Adequate management of asymptomatic dry eye is mandatory especially in patients working outdoors, as it can play a contributory role and hence the importance of dry eye evaluation in all cases of pterygium. Though co morbid conditions like hypertension and diabetes do not play any role in the initiation and progression of pterygium, they can still contribute further to the visual morbidity. Proper understanding of the epidemiology and risk factors of this condition is essential for planning appropriate measures to prevent its occurrence and thereby reduce the physical and financial burden to the society.

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