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Original Research Article

A Study of Keratometric Readings and Astigmatism in Patients with Different Grades of Pterygium Attending Tertiary Eye Care Hospital

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Conflict of interest: Nil

Abstract:

Aim: To evaluate the analysis of keratometric readings and astigmatism in patients with different grades of pterygium.

Materials and Methods: A total of 64 patients(124 eyes) were selected who presented with pterygium. Assessment of pterygium using slit lamp biomicroscopy to establish type, grade, size of pterygium. Autorefractometry was evaluated to determine astigmatism. Refraction was assessed by using a retinoscope. Keratometry-by Bausch and Lomb keratometer.

Results: 60 patients presented with bilateral pterygium while 4 were having unilateral pterygium out of 64 patients with pterygium half of the patients were between the ages of 41-50 years mean age of patient was 45.14+/-9.93 years Overall mean magnitude of astigmatism was 1.429+-0.6225 SD.

Keywords: Pterygium, Retinoscope, Keratometry.

Introduction

Pterygium is a triangular fibro vascular sub-epithelial encroachment of degenerated bulbar conjunctival tissues over the limbus on the cornea [1] A Worldwide disease which is particularly common in tropical and subtropical regions.[3] Excessive exposure to light and dust especially for those doing outdoor jobs are considered as the main risk factors for the development of a pterygium [3-5].

Astigmatism is a state of refraction in which the light rays coming from infinity will be focused onto a line due to difference in refractive power of the eye in different meridians; it is therefore graded according to its progression and involvement of the cornea [7].

Growth of a pterygium over the cornea causes deformation and changes of the curvature of the cornea leading to differences in refractive power of the cornea in the different meridians.[5]

By encroaching on the cornea from the nasal side, a pterygium flattens the horizontal meridian of the cornea and consequently causes induced with the rule (WTR) astigmatism by mechanical traction.[6]

Aim:

- To evaluate the analysis of keratometric readings and astigmatism in patients with different grades of pterygium.
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Objectives

- To analyse patients with different grades of pterygium
- And to assess keratometric readings and astigmatism in them

Materials and Methods:

Study Design: Cross sectional descriptive study

Study Setting: Department of ophthalmology, Andhra Medical College, Government Regional Eye Hospital, Visakhapatnam.

Study Period: 3 months.

Study Population: Patients with pterygium attending EYE OPD.

Sample Size: 64 patients (124 eyes).

Informed consent obtained from all subjects after the nature and possible consequences of the study is explained to them

Inclusion Criteria:

- Patients willing to participate.
- Patients with primary U/L or B/L pterygium.
- Patients above 20 yrs.

Exclusion Criteria:

- Refractive errors before they developed pterygium.
- Keratitis.
- Keratoconus.
- Recurrent pterygium.
- Pseudopterygium.

Methodology:

- Demographic data of all patients included in the study taken.
- The study includes a total of 64 patients (124 eyes), where 60 patients presented with bilateral pterygium and 4 patients had unilateral pterygium.
- UCVA&BCVA-Snellen's visual acuity chart.
- Assessment of pterygium-slit lamp biomicroscopy to establish type, grade, size of pterygium.
- Autorefractometry was evaluated to determine the type, magnitude of astigmatism for both eyes.
- Refraction was assessed objectively by using a retinoscope followed by subjective refraction to obtain the best corrected visual acuity (BCVA).
- Keratometry-Bausch and lomb keratometer.

Statistical Analysis:

Microsoft excel was used in creating data base and producing graphs, while data analysis done using SPSS 20 and expressed in the forms of charts, tables, histograms and pie charts

Observation and Results

- 60 patients were presenting with bilateral pterygium while only 4 were having unilateral pterygium.
- Out of 64 patients with pterygium half of the patients (48.4%) were between the ages of 41 to 50 years.
- The mean age of patient was 45.14 +/- 9.93 years.
- It is noticeable that the largest proportion of the patients (53%) was belonging to the female gender.

Table 1: Socio-Demographic Characteristics of the Study Population:

S. No.	Characteristics	n	percentage
1	**Patient age In Years**		
	° 20—30	3	4.7
	• 31-40	13	20.3
	° 41—50	31	48.4
	• 51-60	14	21.9
	• >60	3	4.7
2	**Gender**		
	• Male	30	47
	• Female	34	53

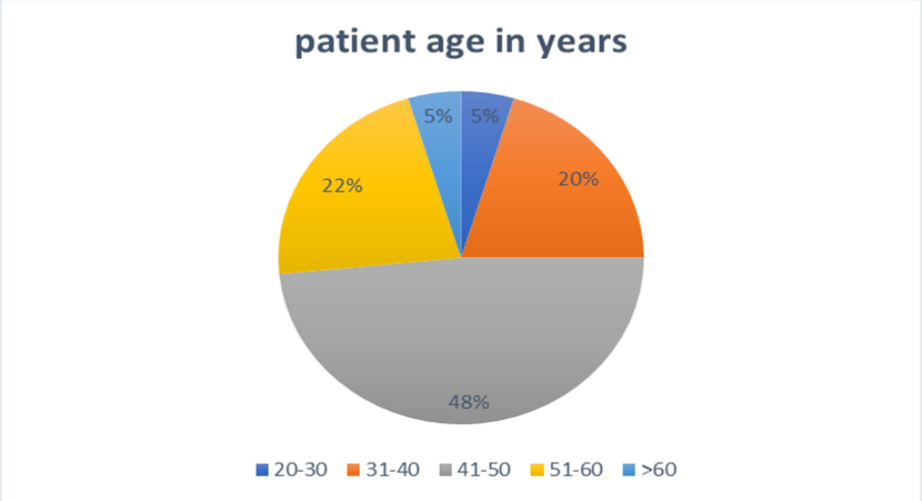

Figure 1: Patient age in years

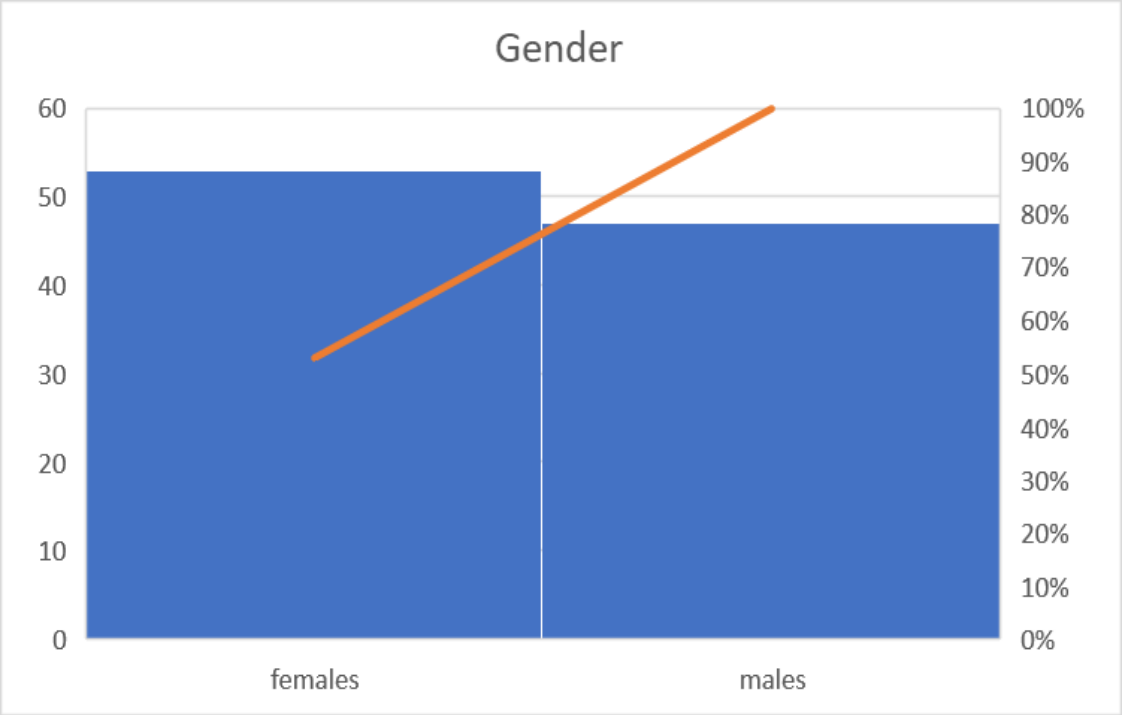

Figure 2: Gender

The findings revealed that, among the affected eyes of the recruited population, a total of 41 (33%) were presenting with small grade pterygium i.e. G2 followed by 27.4%, 22.6%, 17% associated G1, G3 and G4 pterygium.

The overall mean computed for the magnitude of astigmatism for all eyes was 1.429 DC ± 0.6225 SD. The analysis found evidence that with an increasing magnitude of pterygium, there was an increasing trend seen with the grades of pterygium i.e. G4 pterygium had an increased mean of astigmatism (DC) which is 0.54 ± 0.96 DC as compared with mean magnitude of astigmatism (DC) i.e. 0.11 +/- 0.23 DC associated with G1.

Mean magnitude of astigmatism in each grade of pterygium: (N=124 EYES)

Table 2:

Grades	No. of eyes (%)	Mean magnitude of astigmatism (DC)	Overall Mean ±SD of magnitude of astigmatism (DC)
Gr1	34(27.4)	0.11+/-0.23DC	1.429DC ±0.6225SD
Gr2	41(33)	0.37+/-0.49DC	
Gr3	28(22.6)	0.41+/-0.89DC	
Gr4	21(17)	0.54+/-0.96DC	

Table 3:

grades	No. of eyes	Eyes with astigmatism >1 diopter	p-value
G1	34	0(0%)	
G2	41	3(7.3Po)	
G3	28	20(71.4P)	0.0001
G4	21	19(90.4%)	0.001

This table reports the independent association between grades of pterygium and corneal astigmatism of more than 1 diopter.

P-values showed that G3 and G4 show more strong and significant association which is 0.0001 and 0.001 respectively if compared with G1 and G3 that show no positive association with astigmatism of more than one diopter. Among different grades of pterygia, 90.4% eyes belonging to grade 4 were presenting with astigmatism of more than one diopter.

Similarly, 71.4% eyes belonging to grade 3 were presenting with astigmatism of more than one diopter.

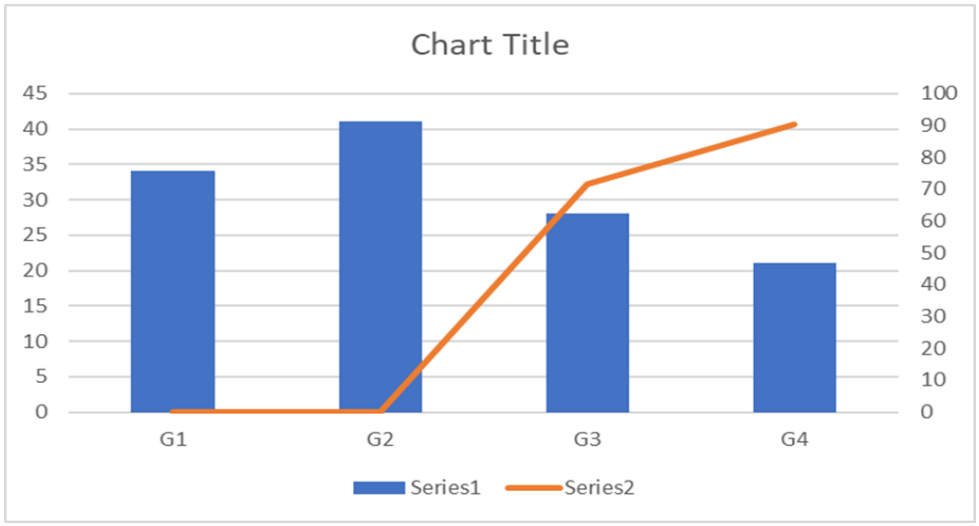

Figure 3:

This table highlights the correlation between grades of pterygium and induced astigmatism and keratometric readings as independent variables. Induced pterygium and keratometric readings show a positive relationship with the grades of pterygium i.e. r=0.786, =0.001 and r=0.922, =0.001 respectively.

Table 4:

	Grades of Pterygium	
Variables	**Pearsons Correlation (r)**	**P Value**
Induced Astigmatism	0.786	0.001
Keratometric Readings	0.922	0.001

Discussion

Pterygium is a disease spread across the world and prevalence is more common in countries located near the equator.

The present study was conducted to determine the prevalence of patients with pterygium coming to eye clinic, keratometric readings and types of astigmatism in various grades of pterygium. A total of 124 eyes affected with pterygium were included in the study. The prevalence of pterygium reported in the current study was 7.06%. If we compare our findings of the mean age group of patients in which patients are more effected with pterygium are in line with the findings of previous studies. Some of the reasons reported are exposure to UV rays, dust and instability of tear film playing an important role in development of a pterygium which is very common in the age above 40 years due to physiological changes in the corneal epithelium. In this study, 27.4% eyes lie in the grade 1 pterygium which opposes the findings of the study conducted in Northwest Ethiopia in which the proportion is higher i.e. 64% than reported in our study.

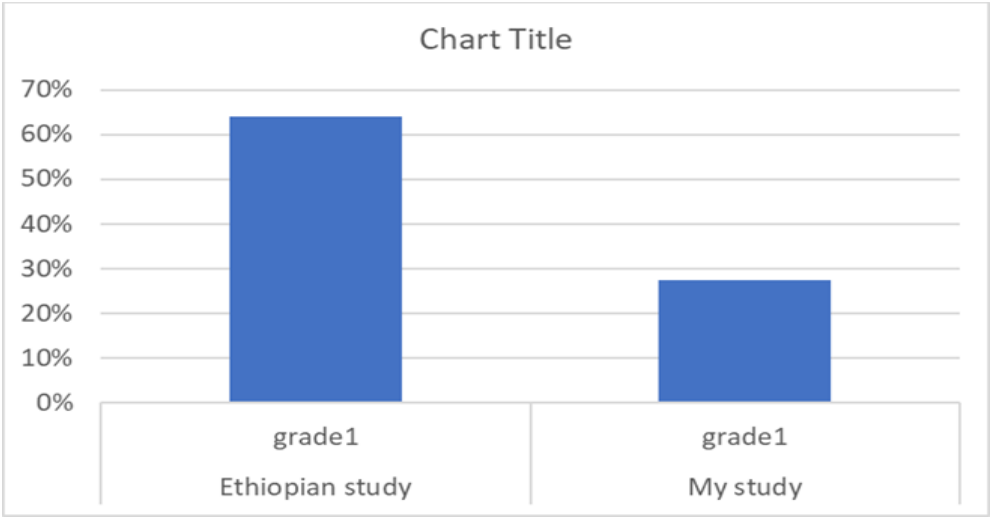

Figure 4:

The Ethiopian study used the surgical classification of pterygia where there are only 3 grades compared to 4 in the current study. Also, my study depicts eyes with grade 4 pterygium had the highest mean (0.54 +/- 0.96 DC) amount of astigmatism

Likewise, in this grade, there was a highest proportion (90.9%) of eyes with astigmatism of more than one diopter.

This is in contrast to the study in Iraq where comparatively higher proportions of significant astigmatism was also found in 5(16.6%) of eyes with pterygium grade 2.

In this study, most (72.5%) eyes presented with high keratometric readings (K2) indicating with the rule astigmatism (WTR).

My study computed the correlation between grades of pterygium, astigmatism and keratometric readings which indicated a positive correlation between the grade of pterygium and the amount of astigmatism.

The increasing size of a pterygium results in increased of curvature and irregularity of the cornea leading to astigmatism.

Conclusion

The present study concludes that magnitude of astigmatism increases with increasing grade of pterygium.

Grades of pterygium established a significant correlation between keratometric readings and induced astigmatism

Recommendations: Keratometry and refraction should be done in all patients with pterygium.

Those patients found to have with the rule astigmatism of more than one diopter need be counselled for pterygium excision

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