

## Original Article

## Variations In Refractive Errors Induced By Pterygium Among Diverse Age Groups In Eye Opd Of Holy Family Hospital Rawalpind

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### Abstract

**Objective:** To determine the refractive errors in patients diagnosed with pterygium, to analyze the relationship between the size and location of pterygium and the magnitude of refractive errors.

**Study design:** It was a Descriptive Hospital based study.

**Place and duration of study:** The study was conducted at Holy Family Hospital in Rawalpindi from Feb to July 2024.

**Material and Methods:** 100 patients of different age groups visited Eye OPD of Allied Hospital Rawalpindi during Feb to July 2024 were included in my study. Patients were exposed to various diagnostic procedure to find out the grading of pterygium and severity of refractive error. The detailed diagnostic procedure include examination with slit lamp, auto refractometer, subjective refraction and fundus camera.

**Results:** Results are summarize on the basis of selected variables i.e. gender, age, grading of pterygium, refractive status after refraction and treatment options. A sample of 100 patients were studied in hospital based study. A detailed history was taken from each patient and meticulous ocular investigations were done. Total of 8000 to 10000 patients visited eye OPD of Holy Family Hospital Rawalpindi during my study period. I took sample of 100 patients who were presented with complain of pterygium.

**Conclusion:** In conclusion, my research on pterygium induced refractive error among different age groups suggests that there is a correlation between the present of pterygium and changes in refractive error. In my study 22% patients were myopic, 26% were hyperopic and astigmatism was present in 52% patients after optical correction. In this study 42% patients were prescribed with medical medications and 58% were referred to surgical procedure.

### 1. Introduction

A pterygium is a benign growth of the conjunctiva, the thin tissue that covers the white part of the eye, which extends onto the cornea and typically forms a wedge-shaped pattern. This condition is most commonly caused by prolonged exposure to ultraviolet (UV) radiation from the sun, which can damage the corneal epithelium.<sup>(1)</sup> Although a pterygium is generally harmless and does not always require treatment, it may need to be surgically removed if it affects vision. The exact cause of pterygium remains unclear, but excessive UV radiation exposure is believed to be a contributing factor. Additionally, prolonged exposure to dusty or sandy environments, particularly in dry and windy areas, may also play a role in its development. The likelihood of developing a pterygium tends to increase with age.<sup>(2)</sup> This condition is more common in individuals who experience frequent exposure to environmental factors like pollen, smoke, wind, dry

conditions, or who have a history of pterygium.<sup>(3)</sup> Pterygium does not always cause symptoms.<sup>(4)</sup> Common symptoms of a pterygium include redness, blurred vision, eye irritation, and a burning or itchy sensation. If the pterygium grows large enough to cover the cornea, it can impair vision. In rare cases, it may cause significant scarring of the cornea.<sup>(5)</sup> The condition can be classified into four stages: Stage 1: The lesion is confined to the limbus with minimal papillary response and flat conjunctival and corneal tissues. Stage 2: The lesion extends slightly beyond the limbus without surpassing it. Vascularity remains normal, with a slight elevation of conjunctival and corneal tissues. Stage 3: The lesion extends from the limbus to the pupillary margin, showing moderate vascularity and visible vessel congestion.

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The lesion measures up to 1 mm. Stage 4: The lesion reaches the center of the pupillary margin, extending beyond 1 mm, with significant vessel congestion and dilation. Pterygium should be differentiated from conditions like pinguecula and pseudo-ptyerygium, which share similarities in both etiology and histology. Pinguecula is a yellowish growth on the bulbar conjunctiva near the limbus, typically consisting of fat, protein, or calcium deposits. Pseudo-ptyerygium is a fold of the bulbar conjunctiva attached to the cornea. When the pterygium extends more than 2.2 mm, has a width greater than 5 mm, or exceeds 6.25 mm<sup>2</sup> in total area, it may cause corneal astigmatism.<sup>(6)</sup> The extent and total area of a pterygium have a stronger correlation with corneal astigmatism than its width. Once the pterygium reaches a certain size, it can cause clinically significant astigmatic changes in the central cornea, particularly with-the-rule astigmatism, which may not be detected through standard subjective refraction. This information is useful in identifying patients who may require surgical treatment.<sup>(7)</sup> Pterygium primarily affects the conjunctiva and cornea and can lead to various refractive errors, especially when it alters the corneal shape. It may induce astigmatism, particularly when it extends onto the cornea and causes irregularities that alter its curvature. This can result in refractive errors, such as against-the-rule astigmatism, where the steepest curvature is along the vertical meridian. In some cases, pterygium can also cause a myopic shift, especially if it invades the cornea. An asymptomatic pterygium typically requires no treatment. However, symptomatic cases can be managed through several approaches: ocular lubricants in the form of eye drops for dry eye symptoms, spectacles for mild astigmatism, steroid eye drops for inflammation, and surgical removal for cosmetic concerns, progressive pterygium affecting the visual axis, large pterygium causing significant astigmatism, recurrent inflammation, or double vision due to the pterygium.

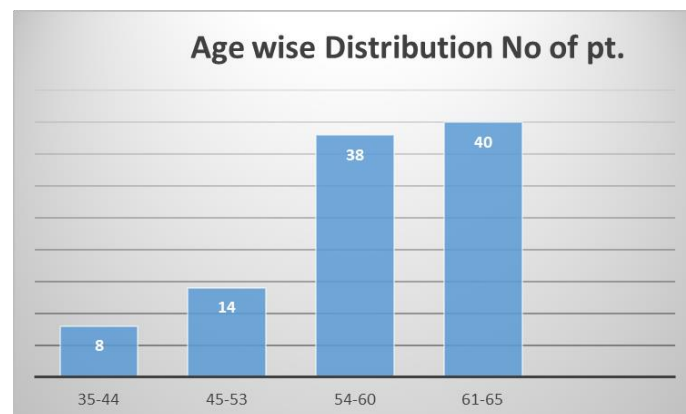
## 2. Materials & Methods

A total of 100 patients from various age groups who visited the Eye OPD at Allied Hospital Rawalpindi between February and July 2024 were included in my study. The patients underwent a range of diagnostic procedures to assess the grading of pterygium and the severity of refractive errors. The diagnostic methods included slit lamp examination, auto-refractometer, subjective refraction, and fundus photography.

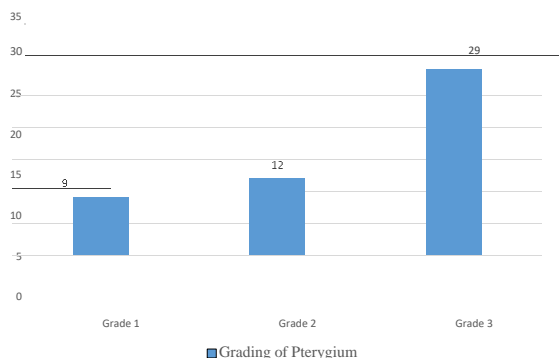
## 3. Results

The findings of this study are based on variables such as gender, age, pterygium grading, refractive status, and treatment strategies. A total of 100 patients were diagnosed with pterygium in this hospital-based study. The results show a significant correlation between pterygium and changes in refractive error. Among the sample population, 52% were astigmatic, 26% were hyperopic, and 22% were myopic. After diagnosis, 42% of patients were prescribed medication, while 58% were referred for surgical treatment.

**Graph No. 1: Age wise distribution of patients**



**Graph No. 2: Grading of Pterygium**



**Table No. 1: Correlation Analysis**

	1	2	3	4
<i>Pterygium</i>	1			
<i>Myopia</i>	.084	1		
<i>Hyperopia</i>	.124**	.026**	1	
<i>Astigmatism</i>	.980**	.047	.448**	1

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

The above table represent the correlation of variables with each other such as; Pterygium, Myopia, Hyperopia and Astigmatism. Myopia is significantly positively related to Pterygium at -.084, Hyperopia is positively correlated with Pterygium at .124\*\* and strongly and positively correlated with Astigmatism at .980\*\*. It means that astigmatism is most common refractive error after optical correction of Pterygium.

**4. Discussion**

Pterygium is a triangular tissue growth on the surface of the eye that can impact vision if it extends onto the cornea. This study aimed to explore the variation in refractive errors in patients diagnosed with pterygium. Due to limited resources and the short duration of the study, a hospital-based approach was used rather than a population-based one. Visual acuity in patients declined

according to the stage of pterygium. The study focused on patients who reported symptoms such as blurry vision at various distances, irritation, eye strain, and headaches. The goal was to assess the severity of refractive errors and the size and location of the pterygium.

The study involved 100 patients with complaints of conjunctival growth, including 74 males and 26 females. The largest group, 40%, was between the ages of 61-65. Regarding pterygium grading, 18% had grade 1, 24% had grade 2, and 58% had grade 3. Patients with grade 1 and 2 pterygium were treated with medication, while those with grade 3 were referred for surgical intervention. The impact of pterygium on refractive errors was apparent.

The data shows a correlation between variables such as pterygium, myopia, hyperopia, and astigmatism. Myopia was negatively correlated with pterygium (-0.084), while hyperopia showed a positive correlation with pterygium (0.124\*\*) and a strong positive correlation with astigmatism (0.980\*\*). This suggests that astigmatism is the most common refractive error following pterygium correction.

Pterygium surgery is generally safe and effective for alleviating symptoms and preventing complications such as visual impairment. The choice of surgical technique depends on factors such as the size and location of the pterygium, the surgeon's expertise, and the patient's individual needs. Postoperative care and follow-up are essential to ensure proper healing and reduce the risk of recurrence.

**Conclusion:**

In conclusion, my research on pterygium induced refractive error among different age groups suggests that there is a correlation between the present of pterygium and changes in refractive error. In my study 22% patients were myopic, 26% were hyperopic and astigmatism was present in 52% patients after optical correction. In this study 42% patients were prescribed with medical medications and 58% were referred to surgical procedure.

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