

Prevalence of Pterygium and its Socio-demographic Determinants among Patients visiting a Rural Tertiary Care Hospital in Northern Maharashtra, India

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ABSTRACT

Background: Pterygium is a benign fibrovascular degeneration of the subconjunctival tissue of the bulbar conjunctiva. It is associated with prolonged exposure to ultraviolet (UV) light, dry climates, and outdoor activities. In India, the prevalence of pterygium is approximately 7%, increasing to 25% with advancing age. It is anatomically and morphologically classified into various grades, yet detailed age-based and morphological studies are limited.

Objective: To estimate the prevalence of pterygium, its distribution across different age groups, and its grading among patients attending the ophthalmic outpatient department (OPD) of a rural tertiary care hospital in Northern Maharashtra, India.

Methods: This cross-sectional study included all patients visiting the ophthalmic OPD during the study period. A total of 278 patients with various ocular morbidities underwent detailed ophthalmic examinations of both eyes. The prevalence of pterygium was determined, and its socio-demographic and anatomical characteristics were analyzed.

Results: Among 278 patients, 75 (27%) were diagnosed with pterygium, with a male predominance of 45 (60%) compared to 31 (40%) females. Age-wise distribution revealed that 3% of patients were aged 20–30 years, 10% were 30–40 years, 7% were 40–50 years, 56% were 50–60 years, 17% were 60–70 years, and 1.3% were 70–80 years. Nasal pterygium was the most common anatomical presentation (76%), followed by temporal (18%) and bilateral (5%) cases.

Conclusion: The prevalence of pterygium among patients in this rural setting was high, with a notable male predominance, particularly in elderly individuals engaged in outdoor activities. The findings suggest that prolonged exposure to hot and dry environmental conditions is a significant risk factor. Preventive measures such as the use of protective eyewear during outdoor activities and timely medical interventions are recommended to reduce disease burden.

Keywords: Pterygium, Prevalence, Grading of Pterygium, Occupation, Socio-Demographic Determinants

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INTRODUCTION

Pterygium is benign wing-shaped elevated elastotic fibrovascular degeneration of subconjunctival tissues of bulbar conjunctiva derived from Greek word *pterygoid* meaning wing/feather. The existence of pterygium has been reported from the ancient times of Hippocrates and Sushruta. Sushruta in his literature described pterygium as "Armans". Indians usually refer to this condition as "Nakhoona" a word from *Devnagiri* script meaning "nail" due to its resemblance with the same. In other regions, it is also called "MASS".

In India prevalence is found to be around 7%. In India, the prevalence of pterygium was reported with advancing age with 6–7% in third decade and 25–26% in seventh decade.⁴

Common complaints of subjects are redness, watering, itching, and diminution of vision. The major risk factors for degeneration are dry, dusty environment and UV radiation which are proven causes of pterygium commonly seen in rural areas.⁸ Advancing age, male sex, increased outdoors activities and occupation lead to pterygium.⁶

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Pterygium, a common ocular surface disorder, can be classified based on morphology and anatomy. Morphologically, it is categorized as progressive, characterized by a thick, fleshy, and vascularized appearance, or atrophic, which is vascular and thin.¹⁹ Anatomically, it is graded as Grade 1, involving

less than 2 mm encroachment onto the cornea; Grade 2, with 2–4 mm encroachment; and Grade 3, involving more than 4 mm encroachment onto the cornea.¹⁹ This condition is rare in younger individuals but is more commonly observed in those above 40 years of age. The present study aims to assess the prevalence and socio-demographic determinants of pterygium among patients attending a rural tertiary care hospital in Northern Maharashtra, India.

This cross-sectional study was conducted in the ophthalmic outpatient department (OPD) of a rural tertiary care hospital in Northern Maharashtra, India. The sample size was determined to be 278 patients based on the estimated prevalence of pterygium by using the formula $n = 4 * p * q / d^2$ where, $z = 1.96$ (at 95% confidence level) $p =$ prevalence $q = 100 - p$, $d =$ allowable error (3%). All patients presenting to the ophthalmic OPD during the study period were included in the study. Detailed ophthalmic examinations were performed on both eyes of each patient to diagnose pterygium and classify its grade based on anatomical and morphological criteria. Socio-demographic details, including age, gender, and occupation, were recorded to assess potential determinants of the condition. The collected data were systematically recorded in Microsoft Excel for organization and analysis. Statistical analyses were conducted to determine the prevalence of pterygium, its distribution across various age groups and genders, and its association with occupational and environmental factors. Descriptive statistics were used to summarize the findings.

All patients presenting to the Ophthalmology Outpatient Department (OPD) during the study period were included. The study excluded patients presenting with any of the following conditions:

1. History of ocular trauma.
2. History of chemical injuries.
3. Previous ocular surgery.
4. Presence of pinguecula.
5. Diagnosis of pseudo pterygium.
6. Sjögren's syndrome.
7. Irregular ocular surface.
8. Ocular surface squamous neoplasia.

All patients included in the study underwent a comprehensive ophthalmic evaluation, which consisted of visual acuity assessment, refraction testing, anterior segment examination using a slit lamp, and fundus evaluation. For patients diagnosed with pterygium, detailed observations were recorded, including the side affected (right eye, left eye, or both), progression of the lesion (classified as progressive or atrophic), position (nasal, temporal, or both), and grade (categorized into Grade I, II, or III). Additionally, autorefractometer values and keratometry readings were documented to assess refractive errors and corneal curvature changes associated with the condition.

RESULTS

A total of 278 patients with various ocular morbidities were registered in the Ophthalmology Outpatient Department.

Out of these 278 patients examined, 75 individuals were diagnosed with pterygium, resulting in a prevalence rate of 27%. This finding underscores the relatively common occurrence of pterygium within the studied population.

Table 1: Demographic characteristic of the patients.

Variable	Level	N (75)	%
Sex	Female	31	41.33%
	Male	44	58.67%
Occupation	Farmer	39	52.00%
	Housewife	20	26.67%
	Job	2	2.66%
	Worker	14	18.67%
	Mean	54.25	
Age	Std Dev	10.30	
	Min	22	
	Median	57	
	Max	75	
	Mode	57	

The study involved a total of 75 participants, who were characterized by their sex, occupation, and age. Among them, males comprised the majority, with 44 participants (58.67%), while females accounted for 31 participants (41.33%). This gender distribution highlights a slight predominance of male participants in the study population. As occupation, the largest group of participants were farmers, making up 52% of the sample (39 individuals). Housewives represented the second-largest group, comprising 26.67% of participants (20 individuals) (Table 1). Workers accounted for 18.67% (14 individuals), while participants engaged in business and jobs were minimal, with only one individual each (1.33%). This occupational distribution indicates that the sample primarily consisted of individuals involved in agriculture, followed by domestic roles and manual labor.

The age of the participants ranged from 22 to 75 years, with an average (mean) age of 54.25 years and a standard deviation of 10.30 years, reflecting a moderately wide spread of ages. The median and mode ages were both 57 years, suggesting that the most common age among participants clustered around the late 50s. This age distribution suggests that the study population was predominantly middle-aged to older adults, with a significant proportion in their late 50s.

In summary, the study participants were predominantly male and engaged in farming, with a middle-aged to older demographic profile. This demographic structure provides an important context for interpreting the findings and their relevance to similar populations.

Pterygium was graded as grade 1 when it touches limbus, grade 2 when it is at half the distance between the limbus and pupillary margin, grade 3 when it touches pupillary margin and grade 4 when it crosses the visual axis to the other side.

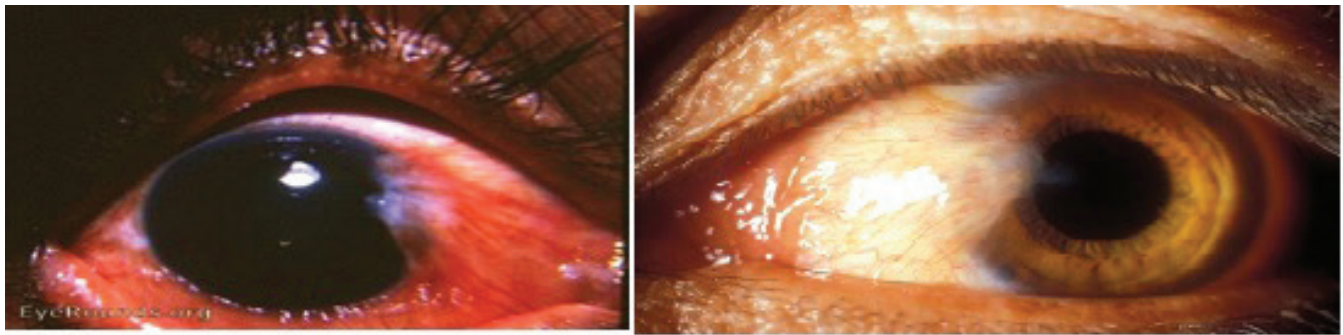


Figure 1: Temporal and Nasal Side Pterygium.

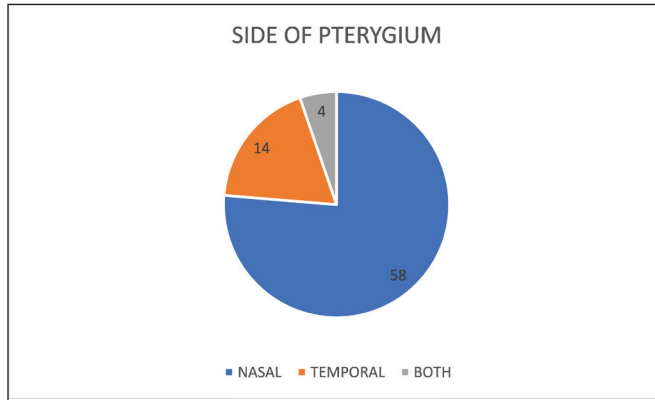


Figure 2: Side of pterygium.

In the majority of cases, pterygium was observed on the nasal side of the eye, accounting for 58 patients (76%). A smaller proportion, 14 patients (18%), had pterygium located on the temporal side, while 4 patients (5%) presented with pterygium on both sides (Figures 1 and 2). This distribution highlights a predominance of nasal-side involvement, which is consistent with the typical pattern influenced by environmental and anatomical factors.

DISCUSSION

Pterygium is characterized by a wing-shaped, triangular fold of conjunctiva, representing a degenerative state of vascularized granulation tissue proliferating as subconjunctival tissue. The pterygium prevalence was observed to be 27%. The condition was more common among males (59%) than females (40%), likely due to greater exposure to environmental factors such as dust, heat, wind, and sunlight during outdoor activities or extended work hours. This finding aligns with the observations of Hashemi H *et al.*,¹ who highlighted the role of prolonged outdoor exposure in pterygium development. Similarly, Visco E *et al.*¹⁰ demonstrated a direct relationship between pterygium and UV exposure.

Occupational analysis in this study revealed that farmers (51%) were most affected, followed by laborers (26%) and housewives (14%). These results resonate with other findings,^{2,3} who emphasized the heightened risk among individuals frequently exposed to harsh environmental conditions.

The anatomical predilection of pterygium was predominantly on the nasal side (76%), compared to the temporal side (18%),

with bilateral cases being rare (5%). Archila EA *et al.*³ explained this phenomenon as being due to the flow of tears toward the medial side and the transmission of UV light from the temporal side through the corneal stroma to the nasal side.

Age-wise distribution indicated that the majority of patients (56%) were between 50–60 years old, suggesting an increase in prevalence with advancing age. This observation is consistent with the another finding showing similar trend.¹¹ Previous studies have also highlighted the protective role of regular use of UV-blocking glasses. These glasses effectively shield the eyes from harmful UV radiation, reducing the risk of developing pterygium and other related ocular conditions.

CONCLUSION

This study highlights the significant prevalence of pterygium (27%) among patients attending a rural tertiary care hospital, with a notable male predominance (59%) due to greater outdoor exposure to UV radiation, dust, wind, and heat. The condition was most common in individuals aged 50–60 years, indicating an age-related increase in prevalence. Occupational exposure was a key factor, with farmers and laborers being the most affected groups. Anatomically, pterygium was predominantly observed on the nasal side (76%), aligning with the established understanding of tear flow dynamics and UV light transmission. Bilateral pterygium cases were relatively rare (5%), with most patients presenting unilateral involvement.

The findings underscore the importance of preventive measures, such as the regular use of protective eyewear, to mitigate UV exposure and reduce the burden of pterygium, especially in high-risk populations. Raising awareness and promoting early treatment can significantly improve ocular health outcomes in rural settings

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