

# Prevalence and Risk Factors of Pterygium in a Semi Urban Area

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## Abstract

**Introduction:** Pterygium is one of the very common ophthalmic disorders with an unknown etiology and pathogenesis. Growth of pterygium into the cornea can result in visual impairment, astigmatism, loss of corneal transparency, visual axis obstruction.

**Materials and methods:** This cross sectional study was done on 500 patients, where demographic details was taken from all the patients including living environment, status, time outdoors, familial history, drug abuse, history of smoking, type of work and education, use of glasses. All of them underwent regular ophthalmic examinations including systemic and comprehensive examination as well as refraction.

**Results:** The prevalence of Pterygium was 12.6%. 35.6% of the patients were females and 64.4% were males. 51.2% belonged to the 30-39 year age group. 33.3% were farmers and 54% were manual labourers, 61.9% of the patients had passed their high school while 28.6% were illiterate, 73% had no familial history of pterygium, 61.9% were regular smokers and 25.4% were occasional smokers. 36.5% of the patients had hypertension and 25.4% were obese.

**Conclusion:** Pterygium formation in our geographical area is quite high and the most common risk factor is exposure to sunlight. Male gender, hypertension and smoking also appear to be associated risk factors. Use of sunglasses may help in reduction of the prevalence of Pterygium.

**Keywords:** Pterygium, hypertension, risk factors, prevalence

## Introduction

Pterygium is an inflamed wing shaped fleshy, fibrovascular growth that extends from the interpalpebral conjunctiva upto the cornea <sup>[1-3]</sup>. It is one of the very common ophthalmic disorders with an unknown etiology and pathogenesis. It was introduced for the first time into the English language by Walton in 1875 <sup>[4]</sup>. As it has an unknown pathogenesis, its intervention and treatment has resulted in less success <sup>[5, 6]</sup>.

Growth of pterygium into the cornea can result in visual impairment, astigmatism, loss of corneal transparency, visual axis obstruction <sup>[6]</sup>. If left untreated, it may lead to blindness with personal, social and economic costs <sup>[6, 7]</sup>.

The causes of pterygium remain unknown. For some time, it was thought that environmental factors were responsible and later, it was said that exposure to ultraviolet rays was a reason.

Since most of the times, the pterygia is concentrated on the nasal limbus, it is proposed that the reason is the reflected sunlight which is focused at this point [8-10].

The prevalence of pterygium is reported to range from 0.3% to 37.1% in different studies [6, 11-13]. Since it may be associated with exposure to UV light, it is more common in the tropical countries, closer to the equator, where the people are more outdoors [14].

In this study, we tried to determine the prevalence of pterygium and its associated risk factors among the patients attending our department.

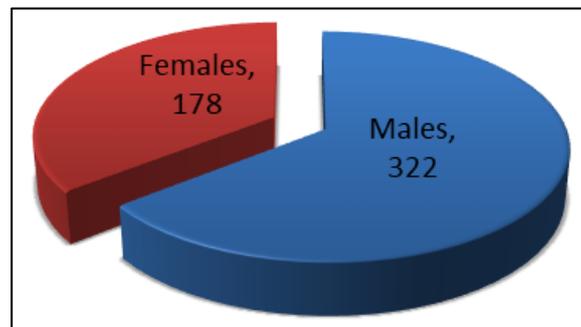
## Materials and Methods

This cross sectional study was done in department of Ophthalmology at Malla reddy medical college for women during the period from May 2020-Jan 2022. A total of 500 patients above 18 years of age, attending our department were selected using systematic random sampling method and were included into the study. Prior to the inclusion, the nature of the study was explained thoroughly to the patients and informed consent was taken from them. Patients with ocular illness or damage were excluded from the study.

Demographic details was taken from all the patients including living environment, status, time outdoors, familial history, drug abuse, history of smoking, type of work and education, use of glasses. All of them underwent regular ophthalmic examinations including systemic and comprehensive examination as well as refraction. Dry eye and its severity if present was identified and graded.

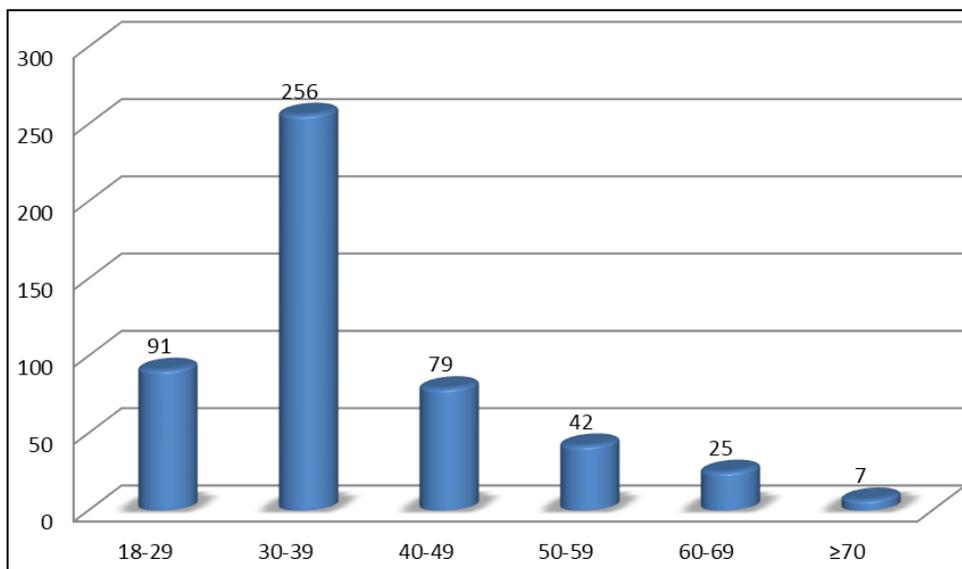
## Results

Out of 500 patients included in the study, 178 (35.6%) were females and 322 (64.4%) were males (Fig: 1)



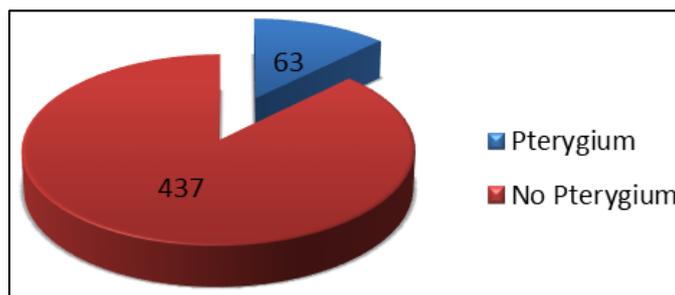
**Fig 1:** Age wise distribution of the patients

Most of the patient's i.e. 256 (51.2%) belonged to the 30-39 year age group, while 91 (18.2%) belonged to 18-29 year age group. 79 (15.8%) of the patients were between 40-49 years (Fig: 2).



**Fig 2:** Age wise distribution of the patients

The incidence of pterygium among the patients attending our hospital was 63 out of 500 (12.6%) (Fig: 3). Out of this 41(65.1%) were males and 22 (34.9%) were females



**Fig 3:** Incidence of Pterygium

Out of 500 patients, 157 (31.4%) were farmers, 105 (21%) were manual labourers, 47, (9.4%) were housewives, 37 (7.4%) were in sales. 19 (3.8%) of the patients were students. 215 (43%) had passed their 10<sup>th</sup> standard, while 29 (5.8%) were graduates. 156 (31.2%) were illiterates. 151 (30.2%) of the patients were regular smokers while 120 (24%) were occasional smokers. 129 (25.8%) were nonsmokers.

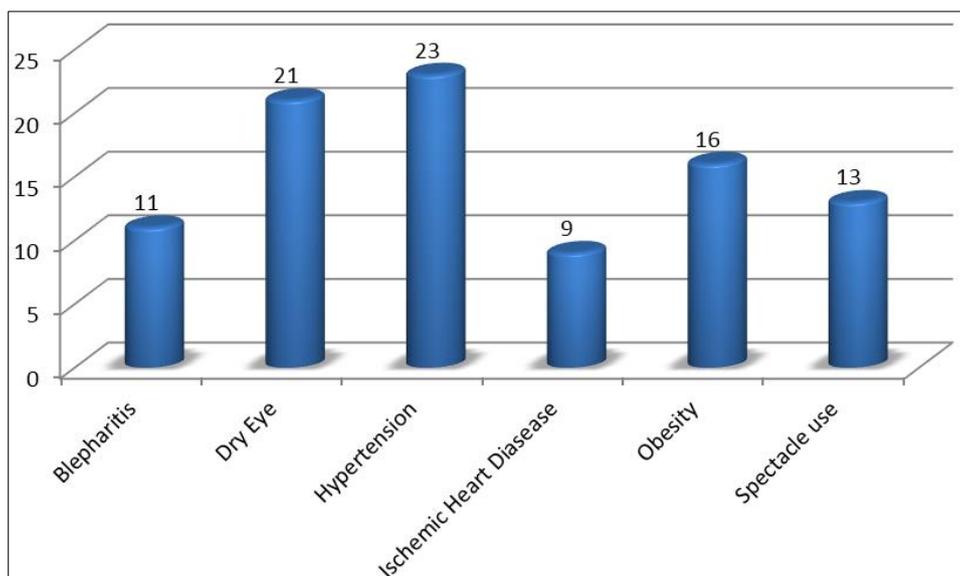
Out of the 63 patients with pterygium, 21 (33.3%) were farmers, 34 (54%) were manual labourers, 3 (4.8%) were in sales. 1 (1.6%) was a student. 39 (61.9%) of the patients had passed their high school while 18 (28.6%) were illiterate. 46 (73%) had no familial history of pterygium, while 17 (27%) of them had a family member who also suffered from the condition. 39 (61.9%) were regular smokers and 16 (25.4%) were occasional smokers (table: 1).

**Table: 1:** Demographic details of patients

Details	Number (%)	Total
Occupation		
Housewife	1 (1.6%)	47 (9.4%)
Clerk	1 (1.6%)	23 (4.6%)
Sales	3 (4.8%)	37 (7.4%)
Student	1 (1.6%)	19 (3.8%)
Farmer	21 (33.3%)	157 (31.4%)

Manual labourer	34 (54%)	105 (21%)
Others	2 (3.2%)	12 (2.4%)
Education		
Illiterate	18 (28.6%)	156 (31.2%)
High school	39 (61.9%)	215 (43%)
Graduation	6 (9.5%)	29 (5.8%)
Familial History		
Yes	17 (27%)	-
No	46 (73%)	
Smoking		
Non-smoker	8 (12.7%)	129 (25.8%)
Occasional	16 (25.4%)	120 (24%)
Regular	39 (61.9%)	151 (30.2%)

11 (17.5%) of the patients had Blepharitis and 21 (33.9%) had dry eye. 23 (36.5%) had hypertension, 9(14.3%) were patients of ischemic heart disease. 16 (25.4%) were obese and 13 (20.6%) used spectacles (Fig 4).



**Fig 4:** Other comorbidities

## Discussion

Pterygium is one of the common disorders with fibrovascular proliferation extending from conjunctiva and Tenon Capsule to the cornea. The etiology for this disorder is unknown although there have been a few risk factors that have been proposed.

In the present study the number of males affected (65.1%) were significantly more than the females (34.9%), with the males being twice more than the females. In a study by Malekifar *et al.*, Males were significantly higher in number among the patients to be affected in univariate analysis, but this significance was lost in the multivariate analysis [15]. In a study by Rezwani *et al.*, there was no significant difference of the incidence between males and females [16]. In contrast to our study, a study done in China reported more number of females to be affected rather than males [17, 18]. Closer to home, a study by Marmamula reported an incidence of 11.7% [19], which was comparable to our study. Another study in Tamil Nadu reported a prevalence of 9.5% [20].

The most common age group to be affected was between 30-39 years. Mackenzie *et al.* have reported an increasing rate among the second or the third decade of life, in accordance to our

study<sup>[9]</sup>.

The incidence of Pterygium in this study was 12.6%. A study by Rezwan *et al.* have reported a prevalence of 12% which was similar to our study<sup>[16]</sup>. A prevalence of 8.8% was observed in another study by Pyo *et al.*<sup>[21]</sup>. In Southern China, 33% prevalence was observed and in a Japanese study, it was 30.8%<sup>[17, 22]</sup>. The lowest incidence was observed in Australia, in a study by McCarty *et al.*<sup>[23]</sup>.

87.3% of the patients were either farmers or manual labourers, both of which involved outdoors work, thereby exposing them to sunlight and ultraviolet light. Similar risk factor was discussed by Malekifar *et al.* in their study<sup>[15]</sup>. Sun *et al.* in their study also implicated sun exposure due to outdoors to be a common risk factor<sup>24</sup>. Sun, to be a cause for pterygium is also iterated by the fact that it appears mostly on the nasal limbus<sup>[10, 25]</sup>.

Almost 62% of the patients had education upto high school while 28.6% of them were illiterate. Although some of the studies have found an association with the lower levels of education as a risk factor, few others have not found any association<sup>[19, 26]</sup>. A study by Malekifar also found no association between education and formation of Pterygium<sup>[15]</sup>. Marmamula *et al.* found a higher prevalence of Pterygium among the people with no or lower educational levels and lower socioeconomic status, similar to our study<sup>[19]</sup>.

Most of them (73%), did not have a previous history of pterygium in their family though. Malekifar *et al.* have found a strong link between familial history and pterygium, in contrast to our study<sup>[15]</sup>.

Out of 87.3% of the smokers, 61.9% of them were regular smokers while 25.4% were occasional smokers. This association was found to be significant. In a study by Malekifar *et al.*, a similar association was found between Pterygium and smoking<sup>[15]</sup>. Another study by Rezwan *et al.* also reported that a strong association exists between the Pterygium formation and smoking<sup>[16]</sup>. A systematic analysis by Rong *et al.* have summarized that smoking had a protective effect against Pterygium<sup>[27]</sup>. However, there is no concrete conclusion of an association between smoking and pterygium as the biological pathways are not properly understood<sup>[15]</sup>.

Hypertension was the most common comorbidity (36.5%), followed by dry eye (33.9%). Obesity was observed in 25.4% of the patients. Ang *et al.* and Peiretti *et al.* also reported similar results in their respective studies<sup>[28, 29]</sup>. In a Malay study, increased Pterygium was found among the patients with higher systolic Blood pressure<sup>[13]</sup>.

## Conclusion

Our study shows that in males with a higher exposure to sunlight and smoking the prevalence of pterygium is higher. This is more common among the people with lesser education and lower economic status. Use of sunglasses while outdoors may help to decrease the prevalence.

## References

- 1 Buratto L, Phillips RL, Carito G, editors. *Pterygium Surgery*. Thorofare, NJ: Slack Inc; 2000, 21-25.
- 2 Coster D. Pterygium: An ophthalmic enigma. *Br J Ophthalmol*. 1995;79:304-305.
- 3 Jaros PA, De Luise VP. Pingueculae and pterygia. *Surv Ophthalmol*. 1988;33:41-49.
- 4 Walton HH. A practical treatise on diseases of the eye. 3rd ed. London: J and A Churchill, 1875.
- 5 Kanski JJ. *Clinical Ophthalmology: A Synopsis*. 6th ed. Oxford: Butterworth-Heinemann Ltd; 2007, 242-243.
- 6 Shiroma H, Higa A, Sawaguchi S, Iwase A, Tomidokoro A, Amano S, *et al.*, Prevalence

- and risk factors of pterygium in a southwestern island of Japan: The Kumejima Study. *Am J Ophthalmol.* 2009;148:766-771.
- 7 Durkin SR, Abhary S, Newland HS, Selva D, Aung T, Casson RJ. The prevalence, severity and risk factors for pterygium in central Myanmar: the Meiktila Eye Study, 25-30.
  - 8 Taylor HR. Ultraviolet radiation and pterygium [Letter]. *JAMA.* 1982;247:1698.
  - 9 MacKenzie FD, Hirst LW, Battistutta D, Green A. Risk analysis in the development of pterygia. *Ophthalmology.* 1992;99:1056-61.
  - 10 Detels R, Dhir SP. Pterygium: A geographical study. *Arch Ophthalmol.* 1967;78:485-91.
  - 11 Wong TY, Foster PJ, Johnson GJ, Seah SK, Tan DT. The prevalence and risk factors for pterygium in an adult Chinese population in Singapore: The Tanjong Pagar survey. *Am J Ophthalmol.* 2001;131:176-183.
  - 12 Fotouhi A, Hashemi H, Khabazkhoob M, Mohammad K. Prevalence and risk factors of pterygium and pinguecula: The Tehran Eye Study. *Eye (Lond).* 2009;23:1125-1129.
  - 13 Cajucom-Uy H, Tong L, Wong TY, Tay WT, Saw SM. The prevalence of and risk factors for pterygium in an urban Malay population: The Singapore Malay Eye Study (SiMES) *Br J Ophthalmol.* 2010;94:977-981.
  - 14 Saw S, Tan D, Tan D. Pterygium: prevalence, demography and risk factors. 2009, 6586.
  - 15 Malekifar P, Esfandiari H, Behnaz N, *et al.* Risk Factors for Pterygium in Ilam Province, Iran. *J Ophthalmic Vis Res.* 2017;12(3):270-274. Doi: 10.4103/jovr.jovr\_85\_16
  - 16 Rezvan F, Hashemi H, Emamian MH, Kheirkhah A, Shariati M, Khabazkhoob M, *et al.* The prevalence and determinants of pterygium and pinguecula in an urban population in Shahroud, Iran. *Acta Med Iran.* 2012;50:689-696.
  - 17 Wu K, He M, Xu J, Li S. Pterygium in aged population in Doumen County, China. *Yan Ke Xue Bao.* 2002;18:181-184.
  - 18 Lu P, Chen X, Kang Y, Ke L, Wei X, Zhang W. Pterygium in Tibetans: a population-based study in China. *Clin Experiment Ophthalmol.* 2007;35:828-833.
  - 19 Marmamula S, Khanna RC, Gullapalli RN. Population based assessment of prevalence and risk factors for pterygium in south Indian state of Andhra Pradesh: The Andhra Pradesh Eye Disease study (APEDS) *Invest Ophthalmol Cis Sci.* 2013 iovs 13-12529v1.
  - 20 Asokan R, Venkatasubbu RS, Velumuri L, Lingam V. Prevalence George R. and associated factors for pterygium and pinguecula in a South Indian population. *Ophthalmic Physiol Opt.* 2012;32:39-44.
  - 21 Pyo EY, Mun GH, Yoon KC. The prevalence and risk factors for pterygium in South Korea: the Korea National Health and Nutrition Examination Survey (KNHANES) 2009-2010. *Epidemiol Health.* 2016;38:e2016015. Published 2016 Apr 29.
  - 22 Shiroma H, Higa A, Sawaguchi S, Iwase A, Tomidokoro A, Amano S, *et al.* Prevalence and risk factors of pterygium in a southwestern island of Japan: the Kumejima Study. *Am J Ophthalmol.* 2009;148:766-771.
  - 23 McCarty CA, Fu CL, Taylor HR. Epidemiology of pterygium in Victoria, Australia. *Br J Ophthalmol.* 2000;84:289-292.
  - 24 Sun LP, Lv W, Liang YB, Friedman DS, Yang XH, Guo LX, *et al.* The prevalence of and risk factors associated with pterygium in a rural adult Chinese population: The Handan Eye study. *Ophthalmic Epidemiol.* 2013;20:148-154.
  - 25 Karai I, Horiguchi S. Pterygium in welders. *Br JF Ophthalmol.* 1984;68:347-9.
  - 26 Rim Th, Nam J, Kim EK, Kim TI. Risk factors associated with pterygium and its subtypes in Korea: The Korean national health and nutrition examination survey 2008-2010. *Cornea.* 2013;32:962-970.
  - 27 Rong SS, Peng Y, Liang YB, Cao D, Jhanji V. Does cigarette smoking alter the risk of pterygium? A systematic review and meta-analysis. *Invest Ophthalmol Vis Sci.* 2014;55:6235-6243.

- 28 Ang M, Li X, Wong W, Zheng Y, Chua D, Rahman A, *et al.*. Prevalence of and racial differences in pterygium: a multiethnic population study in Asians. *Ophthalmology*. 2012;119:1509-1515.
- 29 Peiretti E, Dessì S, Mulas C, Abete C, Norfo C, Putzolu M, *et al.*. Modulation of cholesterol homeostasis by antiproliferative drugs in human pterygium fibroblasts. *Invest Ophthalmol Vis Sci*. 2007;48:3450-3458.