SUNTEXT REVIEWS

SunText Review of Medical & Clinical Research
ISSN: 2766-4813

Open Access
Research Article
Volume 5:2

Risk Factors and Socio-Economic Associations of Pterygium: A Cross-Sectional Study

Choudhury RA[1,*], Hossain KA[2], Islam N[3], Pramanik M[4] and Sultana A[4]

[1]*Assistant Professor, Department of ophthalmology, Diabetic Association medical College, Bangladesh*
[2]*Professor of ophthalmology, Diabetic Association Medical Colllege and Hospital, Bangladesh*
[3]*Assistant professor, Department of surgery, Diabetic Association medical College, Bangladesh*
[4]*Medical Officer, BNSB Zahurul Hague eye hospital, Bangladesh*

[*]**Corresponding author:** Choudhury RA, Assistant Professor, Department of Ophthalmology, Diabetic Association medical College, Faridpur, Bangladesh; E-mail: rahatac260@gmail.com

Received date: 26 November 2024; **Accepted date:** 05 December 2024; **Published date:** 13 December 2024

Citation: Choudhury RA, Hossain KA, Islam N, Pramanik M, Sultana A (2024) Risk Factors and Socio-Economic Associations of Pterygium: A Cross-Sectional Study. SunText Rev Med Clin Res 5(2): 204.

DOI: https://doi.org/10.51737/2766-4813.2024.104

Copyright: © 2024 Choudhury RA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Background: On the superficial cornea/conjunctiva, pterygium is a wing-shaped fibro vascular development of the conjunctiva. Exposure to ultraviolet radiation is the primary cause of this elastotic degeneration of the conjunctival stroma. Various environmental situations have various pterygium prevalence's. Globally, its magnitude ranges greatly from 1.1% to 53%.

Objective: This study was done for assessment of Prevalence and risk factors of pterygium.

Methods: The cross-sectional Observational study was conducted in the BNSB Zahurul Haque Eye Hospital, Faridpur from June 2022 to May 2023. A total of60 subjects of both sexes were included in the study. Data were collected over a period of 12months and analyzed by appropriate computer based programmed software Statistical Package for the Social Sciences (SPSS), version 24.

Results: In this study, about 22 (36.7%) respondents lies between 31 years to 40 years and 18 (30.0%) respondents lies between 20 years to 30 years. Mean ± SD of the respondents was 39.5 ± 1.3 years. More than half of the patient 34 (56.70%) were male and 26 (43.30%) patients were female. About 39 (46.9%) were married, 8 (13.3%) were widowed, 5 (8.3%) were divorced and 8 (13.3%) were single. Nearly half of the participants 29 (48.3%) had 4–6 members in their family. Only 10 (16.7%) of the participants had completed their college/university, 23 (38.3%) had completed primary school, 21 (35.0%) had completed secondary school and 6 (10.0%) were illiterate. About 21 (35.0%) were businessman, 17 (28.3%) were employed, 12 (20.0%) were Farmer/labor and 7 (11.7%) were student. More than half 33 (55.0%) of the participants had a history of sun exposure for five and more hours per day. Indoor was the working area more than half 37 (61.7%) of the participants. About 19 (31.7%) of the participants had a history of dust exposure. Only 16 (26.7%) use sunglasses/hat for protection. Only 7 (11.7%) had a family history of pterygium.

Conclusion: Among adults in Bangladesh, pterygium was highly prevalent. Reducing sun exposure and wearing a helmet or sunglasses were key factors in preventing the development of pterygium in adults.

Keywords: Risk factors; Pterygium; Socio-economic; Associations

Introduction

Pterygium is an elastotic degeneration of the conjunctival stroma, primarily brought on by exposure to ultraviolet (UV) light. It is a wing-shaped fibro-vascular development of conjunctiva on the superficial cornea/conjunctiva [1,2]. It is among the most prevalent conditions affecting the cornea that impair eye function [3]. Pterygium prevalence ranges from 1.1% to 53% worldwide depending on environmental factors [4-7]. A population-based study in Dhaka, Bangladesh found that the prevalence of pterygium was 3.0%. However, the study's methodology was limited, and the researchers believe that the reported figure is underestimated. Astigmatism is a visual disturbance or diminution brought on by a fibro vascular development that

encroaches on the nasal or temporal cornea [8]. At first, pterygium is asymptomatic [9], but as it worsens, uneven corneal astigmatism increases and visual performance declines due to a loss of corneal transparency in the pupillary region. Pterygium is a potentially blinding condition that can have a negative impact on one's emotional, social, and financial life [10-12] and is responsible for 2.2% of all blindness cases in at least one eye [13]. Patients with pterygium frequently report experiencing redness, ocular irritation, dryness, and discomfort in their eyes [14, 15]. Although the exact cause of pterygium is unknown, some characteristics, such as working outdoors, being elderly, being male, residing in a location with increased UV radiation exposure, and having a dry and windy climate, are linked to its development [16-18].According to a study done in Blue Mountain, Australia, pterygium is significantly linked to lower skin sensitivity, sun-related skin damage, and increased pigmentation (skin and hair color) [19]. The study location is in the tropics, where there hasn't been much prior research on the frequency of pterygium, particularly on its contributing variables. In order to organize and execute frequent screening programs for prevention, early intervention, and risk factor avoidance, this study sought to ascertain the prevalence of pterygium and its contributing factors in adults. Pterygium risk factors include exposure to UV radiation, geographic latitude close to the equator, outdoor activity [20], aging, male gender [21], and dusty environments, according to several research conducted around the world [22]. Wearing brimmed hats and sunglasses with UV protection lenses is advised since UV radiation is the main risk factor for pterygium [2,9]. Depending on the stage of pterygium, the most common therapeutic options include surgery, non-steroidal anti-inflammatory eye drops, artificial tears, and refractive correction for astigmatisms [9]. Surgery for pterygiums is indicated when the cornea exhibits an atypical appearance (cosmetic issue), when it extends toward the visual axis, when it limits eye movement, when it results in astigmatism-induced visual loss, and when a patient reports pterygium expansion.

Methodology

The cross-sectional Observational study was conducted in the BNSB Zahurul Haque Eye Hospital, Faridpur from June 2022 to May 2023. A total of 60 subjects of both sexes were included in the study. Purposive sampling was done according to the availability of the patients who fulfilled the selection criteria. Face to face interview was done to collect data with a semi-structured questionnaire about risk factors and socioeconomic associations. After collection, the data were checked and cleaned, followed by editing, compiling, coding, and categorizing according to the objectives and variables to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

Result

(Table 1) shows that, about 22 (36.7%) respondents' lies between 31years to 40years and 18 (30.0%) respondents lies between 20years to 30years. Mean ± SD of the respondents was 39.5 ± 1.3 years. (Figure 1) shows that, more than half of the patient 34 (56.70%) were male and 26 (43.30%) patients were female.

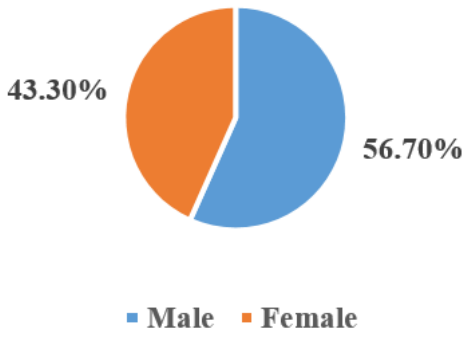

Figure 1**:** *Distribution of the patients according to sex (n=60).*

Table 1: *Distribution of the patients according to age (n = 60).*

Age group	Frequency	%
20–30years	18	30.0
31 - 40years	22	36.7
41 - 50years	8	13.3
51 - 60years	7	11.7
>60 years	5	8.3
Total	**60**	**100.0**
Mean ± SD: 9.5 ±7.3 years		

Table 2*: Distribution of the patients according to marital status (n = 60).*

Marital status	Frequency	%
Married	39	46.9
Widowed	8	13.3
Divorced	5	8.3
Single	8	13.3
Total	**60**	**100.0**

Table 3*: Distribution of the patients according to family size (n=60).*

Family size	Frequency	%
0–3	23	38.3
4–6	29	48.3
≥ 7	8	13.3
Total	**60**	**100.0**

***Table 4**: Distribution of the patients according to educational level (n = 60).*

Educational level	Frequency	%
Illiterate	6	10.0
Primary school	23	38.3
Secondary school	21	35.0
College/university	10	16.7
Total	**60**	**100.0**

***Table 5**: Distribution of the patients according to Occupation (n = 60).*

Occupation	Frequency	Percent
Student	7	11.7
Farmer/labor	12	20.0
Employed	17	28.3
Business	21	35.0
Others	3	5.0
Total	**60**	**100.0**

***Table 6**: Distribution of the patients according to sun exposure (n=60.)*

Sun exposure	Frequency	%
Yes	33	55.0
No	27	45.0
Total	**60**	**100.0**

***Table 7**: Distribution of the patients according to Working area (n=60).*

Working area	Frequency	%
Outdoor	23	38.3
Indoor	37	61.7
Total	**60**	**100.0**

***Table 8**: Distribution of the patients according to Dust exposure (n=60).*

Dust exposure	Frequency	%
Yes	19	31.7
No	41	68.3
Total	**60**	**100.0**

***Table 9**: Distribution of the patients according to Sunglass use (n=60).*

Sunglass use	Frequency	%
Yes	16	26.7
No	44	73.3
Total	**60**	**100.0**

***Table 10**: Distribution of the patients according to family history of pterygium (n=60).*

Family history of pterygium	Frequency	%
Yes	7	11.7
No	53	88.3
Total	**60**	**100.0**

(Table 2) shows that, 39 (46.9%) were married, 8(13.3%) were widowed, 5 (8.3%) were divorced and 8 (13.3%) were single. (Table 3) Shows that, nearly half of the participants 29 (48.3%) had 4–6 members in their family. (Table 4) shows that, only 10 (16.7%) of the participants had completed their college/university, 23 (38.3%) had completed primary school, 21 (35.0%) had completed secondary school and 6 (10.0%) were illiterate. (Table 5) shows that, 21 (35.0%) were businessman, 17 (28.3%) were employed, 12 (20.0%) were Farmer/labor and 7 (11.7%) were student. (Table 6) shows that, more than half 33 (55.0%) of the participants had a history of sun exposure for five and more hours per day. (Table 7) shows that, indoor was the working area more than half 37 (61.7%) of the participants. (Table 8) shows that, 19 (31.7%) of the participants had a history of dust exposure. (Table 9) shows that, only 16 (26.7%) use sunglass/hat for protection. (Table 10) shows that, only 7 (11.7%) had a family history of pterygium.

Discussion

The magnitude of pterygium varies widely from 1.1% to 53% globally. Pterygium formation's underlying mechanism is not well understood. Numerous studies have shown how exposure to ultraviolet (UV) radiation affects pterygium. Nonetheless, there have been contradictory reports on the effects of smoking, age, and gender on pterygium. Pterygium's precise pathophysiology is still unknown. Numerous studies have revealed that race is a risk factor for pterygium. Research involving two or more ethnic groups may shed additional light on how lifestyle variations or genetic predispositions affect pterygium. In this study, about 22 (36.7%) respondents lies between 31 years to 40 years and 18 (30.0%) respondents lies between 20 years to 30 years. Mean ± SD of the respondents was 39.5 ± 1.3 years. More than half of the patient 34 (56.70%) were male and 26 (43.30%) patients were female. About 39 (46.9%) were married, 8 (13.3%) were widowed, 5 (8.3%) were divorced and 8 (13.3%) were single. Nearly half of the participants 29 (48.3%) had 4–6 members in their family. Only 10 (16.7%) of the participants had completed their college/university, 23 (38.3%) had completed primary school, 21 (35.0%) had completed secondary school and 6 (10.0%) were illiterate. About 21 (35.0%) were businessman, 17 (28.3%) were employed, 12 (20.0%) were Farmer/labor and 7 (11.7%) were student. More than half 33 (55.0%) of the participants had a history of sun exposure for five and more hours per day. Indoor was the working area more than half 37 (61.7%) of the participants. About 19 (31.7%) of the participants had a history of dust exposure. Only 16 (26.7%) use sunglasses/hat for protection. Only 7 (11.7%) had a family history of pterygium. In another study, there were 400 study participants in the assessment of pterygium with a response rate of99.50%. The mean age of the study participants was 39.9 ± 9.8years. More than half

219(54.75%) of the study participants were males and slightly higher than two-third 273(68.25%) of the participants were living in rural areas. Among the study participants, almost half 206(51.50%) were married and 179(44.80%) hada family size of 4–6 children in a house. Only 114 (28.50%) of the participants could read and write as well as 164(41.00%) were merchants. More than half 212(53.00%) of the participants had a history of sun exposure for five and more hours per day. Whereas only 97(24.30%) use sunglasses/hat for protection. Besides, almost three-fourth of the study participants 294(73.40%) never use any alcohol product and only 63 (15.80%) had a family history of pterygium. The overall prevalence of pterygium among adults aged 18 years and above in Gambella town was 127(31.80%), (95% CI: 27.30, 36.30) in either eye. Most of the pterygium 101(79.53%) was located to the nasal side of the cornea and the rest 26(20.47%) was located to the temporal part of the cornea. More than half 69(54.33%) of the pterygium was unilateral and the remaining 58(45.67%) was bilateral [23]. In another study conducted in Hebei, China showed that a total of 3790 individuals (2351 Hans and1439 Manchus) met the study criteria, of which 248nwere diagnosed with pterygium (6.5%). There was no significant difference between the prevalence rates in Hans (6.2%) and Manchus (7.2%) (p=0.232). Multi variate analysis revealed that the risk factors for grade 2 or higher pterygium were increasing age (p<0.001) and rural residence (OR 1.83; 95% CI 1.11 to 3.02; p=0.018), while the protective factors include gender (female) (OR 0.58;95% CI 0.37 to 0.88; p=0.011), cigarette smoking (OR0.53; 95% CI 0.34 to 0.83; p=0.005) and myopia (OR 0.50;95% CI 0.33 to 0.77; p=0.002). Premature menopause (OR2.66; 95% CI 1.05 to 6.72; p=0.038) increased the risk of grade 2 or higher pterygium in females, while higher high-density lipoprotein (HDL) (OR 1.94; 95% CI 1.08 to 3.47; p=0.027) was a risk factor of grade 2 or higher pterygium in males [24]. A possible reason behind our high finding could be it is carried out in a hot, dry, and dusty environment with low latitude that might contribute to the occurrence of pterygium [25,26]. Furthermore, different geographical areas nearer to the equator (tropical area) have greater exposure to ultraviolet-B that intern contributes to the occurrence of pterygium [10,20]. The proportion of pterygium in this study is similar to other studies done in Southwest, Japan (30.8%) [10], China (33.98%) [25]. although these countries are located in different geographical areas, the possible reason might be all studies were carried out with similar study design. On the other side, the proportion of pterygium in this study is lower than other studies done in Northwest Ethiopia (38.7%) [8].This might due to geographical, latitudinal, economic, and environmental variations that contribute to the occurrence of the disease [20, 27]. The other possible reason could due to the age groups included in the studies. Adults aged 18years and above were included in this study but, the study done in Gondar, Ethiopia includes adult's age greater than 20 years that might contribute to the occurrence of the pterygium [4,19,21]. Those adults who were exposed to sunlight five hours and above were 6.86 times more likely to develop pterygium than those who were not exposed (AOR = 6.86 (95% CI: 4.00,11.79). This is in line with studies done in South Korea [28], Australia [5], India [30], Koladiba Ethiopia [27]. Although it is difficult to quantify the true amount of one's exposure to sunlight with ultraviolet radiation, many studies had shown that outdoor workers have a higher risk of the development of pterygium [2, 28]. Even though some amount of ultraviolent is important for our body, exposure for five hours and more for acute or long time could cause disorders in skin, conjunctiva, cornea, and lens [2, 20]. Lots of controversies are raised regarding the association of gender and pterygium in different kinds of literature. This study showed that being male was 2.10 times more likely to develop pterygium as compared to females. This result is supported by studies done in Ethiopia [8], Australia [5], China [1, 26], Japan [12], Malaya Indonesia [29], and Central India [20]. Males spent most of their time in outdoor activities in most African countries including Ethiopia. This might intern expose them to develop pterygium [8]. Whereas a study in South Korea [24] showed that being female was associated with pterygium. In contrast, studies in Japan, China [4,30], and Iran [34] indicated that there were no significant differences in the association of gender and pterygium. Cultural differences, differences in ethnicity, and varied environmental factors could affect the exposure status of males and females for pterygium [21]. On the other side, adults who wore sunglass/hat were 62% less likely to develop pterygium as compared to those who did not wear sunglass/hat. This is consistent with studies done in Gondar, Ethiopia [8], and Benin City, Nigeria. A possible reason could be wearing hat/protective sunglasses might reduce the exposure status from UV light and dust particles that might also reduce the development of pterygium [5].

Conclusion

Among adults in Bangladesh, pterygium was highly prevalent. Sunlight exposure, working outside, and male gender were all positively correlated with pterygium development. On the other hand, wearing a helmet or sunglasses prevented pterygium from developing. The only risk factors that could be changed were exposure to sunlight and outdoor activities.

References

1. Ke M, Liang X, Ying J, Jonas JB. Prevalence of and Factors Associated with Pterygium in Adult Chinese: Beijing Eye study. 2007; 26: 1184-1186.
2. Oliva MS, Taylor H. Ultraviolet radiation and the eye. Int Ophthalmol Clin. 2005; 45: 1-17.

3. Yasemi M, Bamdad S, Sarokhani D, Sarokhani M, Sayemiri K, Ali N. Electronic Physician (ISSN: 2008-5842). 2017; 5914-4919.
4. Wang Y, Shan G, Gan L, Qian Y, Chen T, Wang H, et al. Prevalence and associated factors for pterygiumin Han and Mongolian adults: a cross-sectional study in inner Mongolian, China. BMC Ophthalmol. 2020; 20: 45.
5. McCarty CA, Fu CL, Taylor HR. Epidemiology of pterygium in Victoria, Australia. Br J Ophthalmol. 2000; 84: 289-292.
6. Liu L, Wu J, Geng J, Yuan Z, Huang D. Geographical prevalence and risk factors for pterygium: a systematic review and meta-analysis. BMJ open. 2013; 3.
7. Jiao W, Zhou C, Wang T, Yang S, Bi H, Liu L, et al. Prevalence and risk factors for pterygium in ruralolder adults in Shandong Province of China: a cross-sectional study. BioMed Res Int. 2014.
8. Rim THT, Nam J, Kim EK, Kim T. Risk Factors Associated with Pterygium and Its Subtypes inKorea. The Korean National Health and Nutrition Examination Survey 2008–2010.Corena. 2013; 32: 962-970.
9. Prevalence SOF, Factors R, Pterygium FOR, Bihar E. Study of Prevalence and Risk Factorsfor Pterygium In Uday Narayan Singh Punit Parasurampuria. 2019; 426: 75-76.
10. Shiroma H, Higa A, Sawaguchi S, Iwase A, Tomidokoro A, Amano S, et al. Prevalence and risk factorsof pterygium in a southwestern island of Japan: the Kumejima Study. Am J Ophthalmol. 2009; 148: 766-771
11. Durkin SR, Abhary S, Newland HS, Selva D, Aung T, Casson RJ, et al.The prevalence, severity and risk factorsfor pterygium in central Myanmar: the Meiktila Eye Study. British J Ophthalmol. 2008; 92: 25-30.
12. Rezvan F, Hashemi H, Emamian MH, Kheirkhah A. The Prevalence and Determinants of Pterygiumand Pinguecula in an Urban Population in Shahroud. Iran. Acta Medica Iranica. 2012; 50: 689-696.
13. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Polharel GP, et al. World health organization; Global data on visual impairmentin the year 2002. Bull World Heal Organ. 2004; 82: 844-851.
14. Hirst LW. Major Review the Treatment of Pterygium. 2003; 48.
15. Chui J, Girolamo ND, Coroneo MT. The Pathogenesis of Pterygium Concepts Concepts Implications Therapeutic Implications. Ocular Surface. 2008; 6: 24-43
16. Shiromaa H, Higa A, Sawaguchi S, Iwase A, Tomidokoro A, Amano S, et al. Prevalence and Risk Factorsof Pterygium in a Southwestern Island of Japan: The Kumejima Study. Am J Ophthalmol. 2009; 148: 766-771.
17. Lu P, Chen X-M. Prevalence and risk factors of pterygium. Review. Int J Opthalmology. 2009; 2.
18. Panchapakesan J, Hourihan F, Mitchell P. The prevalence of pterygium and pinguecula: the Blue MountainsEye Study. Aust N Z J Ophthalmol. 1998 ; 26: S2-S5.
19. Nemet AY, Vinker S, Segal O, Mimouni M, Kaiserman I. Epidemiology and Associated Morbidity of Pterygium:A Large, Community-Based Case-Control Study. Semin Ophthalmol. 2016; 31: 446-451.
20. Nangia V, Jonas JB, Nair D, Saini N, Nangia P, Panda- S. Prevalence and Associated Factors for Pterygiumin Rural Agrarian Central India. The Central India Eye and Medical Study. Plos one. 2013; 8: 1-6.
21. Song P, Chang X, Wang M, An L. Variations of pterygium prevalence by age, gender and geographic characteristics in China: A systematic review and meta-analysis. PLoS One. 2017; 12.
22. Fekadu SA, Assem AS, Adimassu NF. Prevalence of pterygium and its associatedfactors among adults aged 18 years and above in Gambella town, Southwest Ethiopia, May PLoS ONE. 2020; 15.
23. Pan Z, Cui J, Shan G, Chou Y,Pan L, Sun Z, et al. Prevalence and riskfactors for pterygium: a crosssectional study in Han andManchu ethnic populationsin Hebei, China. BMJ Open. 2019; 9.
24. Rezvan F, Khabazkhoob M, Hooshmand E, Yekta A, Saatchi M, Hashemi H, et al. Prevalence and risk factorsof pterygium: a systematic review and meta-analysis. Surv Ophthalmol. 2018; 63: 719-735.
25. Modenese A, Gobba F. Occupational exposure to solar radiation at different latitudes and pterygium: Asystematic review of the last 10 years of scientific literature. Int J Environ Res Public Health. 2018; 15: 37.
26. Alemayehu TK, Addis Y, Bizuneh ZY, Tegegne M, Alemayehu AM. Prevalence and associated factorsof pterygium among adults living in Kolla diba town. Northwest Ethiopia; 2020; 14: 245-255.
27. Pyo EY, Mun GH, Yoon KC. The prevalence and risk factors for pterygium in South Korea: the KoreaNational Health and Nutrition Examination Survey (KNHANES) 2009–2010. 2016; 38: 1-7.
28. Cajucom-Uy H, Tong L, Wong TY, Tay WT, Saw SM. The prevalence of and risk factors for pterygiumin an urban Malay population: the Singapore Malay Eye Study (SiMES). British J Ophthalmol. 2010; 94: 977-981.
29. Marmamula S, Khanna RC, Rao GN. Population-based assessment of prevalence and risk factors for pterygium in the South Indian state of Andhra Pradesh: the Andhra Pradesh Eye Disease Study. Invest Ophthalmol Vis Sci. 2013; 54: 5359-5366.