



ORIGINAL ARTICLE

Relation Between Different Grades of Pterygium and Amount of Induced Corneal Astigmatism

Bilal Khan¹, Ahmed Sohail^{*}, Tallat Anwar Faridi², Ubaidullah Jan¹, Fatima Zahid¹, Ishrat Parveen³¹ Department of Allied Health Sciences, Superior University, Lahore² Institute Of Public Health, FAHS, University Of Lahore, Lahore.³ Department Of Zoology, University of The Punjab, Lahore

ARTICLE INFO

Key words:

Pterygium and Astigmatism, grades of pterygium, amount of astigmatism

How to Cite:Khan, B., Sohail, A. ., Faridi, T. A. ., Jan, U. ., Zahid, F. ., & Parveen, I. . (2021). Relation between different grades of pterygium and amount of induced corneal astigmatism: Different grades of pterygium. Pakistan BioMedical Journal, 4(2). <https://doi.org/10.54393/pbmj.v4i2.74>

ABSTRACT

Pterygium is more prevalent among people exposed to ultraviolet (UV) light. It occurs more often in people who live in warm climates and spend a lot of time outdoors in sunny or windy environments **Objective:** To determine and the relation of different grade of pterygium with amount of induced corneal astigmatism **Methodology:** This observational study was done in The Layton Rahmatulla Benevolent Trust (LRBT) hospital Multan road Lahore. A self-designed Performa was filled after clinically examining the patients. Frequency distribution/percentages of data were described, simple frequency tables and cross tables were formed to calculate the statistical results **Results:** A total patients 50 with grades of pterygium and induce amount of astigmatism. There 31(62.0%) were male and 19(38.0%) were female and the mean age of the patient is 2.5. 21(42.0%) patients were grade 1 pterygium and 21(42.0%) patients were grade 2 and 8(16.0%) patents have grade 3 pterygium. The amount of astigmatism in grade 1 from 0.00 to 1.00 DC is 17(34.0%) patients, from 1.00 to 2.00 DC are 2(4.0%) patients and from 2.00 to 4.00 DC are 2 (4.0%). In grade 2 from 1.00 to 2.00 DC are 10(20.0%) patients, from 2.00 to 4.00 DC are 10(20.0%) patients and from greater than 4.00 DC 1(2.0%). In grade 3 from 1.00 to 2.00 DC are 2(4.0%) patients, from 2.00 to 4.00 DC are 4(8.0%) patients and from greater than 4.00 DC are 2(4.0%) patients **Conclusions:** Result show that the present study verifies that as the pterygium reaches more than 1.00mm in size from the limbus it induce with the rule astigmatism and pterygium size increases, the amount of induced astigmatism also increases with direct proportion.

INTRODUCTION

Pterygium is the outgrowth of conjunctiva or the growth of pink fleshy mass onto the cornea. It is perhaps the most generally apparent conjunctival surface degenerative problems seen in subtropical and tropical regions [1]. Pterygium cause corneal contortion and initiate a significant measure of astigmatism. Pterygium cause corneal contortion and lot amount of involved the

localized pooling of tears and general caused with the role of corneal astigmatism [2]. Besides causing cosmetics problems, it changes the smoothness of the anterior surface of the eye ball with disturbance of the normal tear film. It also induces corneal astigmatism and if allowed to continue to the pupillary region, decreases the vision [3]. Prevalence of pterygium ranges from 0.7 percent to 31 percent in various studies around

* Corresponding author: Ahmed Sohail
Department of Allied Health Sciences, Superior University, Lahore
sohailmkd12@gmail.com

the world [4]. Pterygium is considered as far because involvement of the cornea. Grade 1 less than 2mm on to the cornea, type 2 includes up to 4 mm of the cornea and grade 3 more than 4 mm of the cornea and covered the visual axis [5]. Pterygium is classified as active or inactive. An inactive pterygium shows small or no evidence of progression over an extended period. Conversely, an active pterygium behaves in a very aggressive fashion, with an advancing margin of grayish opacification and hyperemia within the tissue. The expansion of pterygium onto the cornea can cause to both significant corneal distortion and the development of large amount of corneal astigmatism. Pterygium-induced astigmatism will be the reason for subjective visual complaints, including decreased vision, glare sensitivity and monocular diplopia [6]. The most histopathological changes in essential pterygium are elasticity degeneration of collagen conjunctiva [7]. The complaints which indicates the presence of foreign body, visual loss because corneal astigmatism or growth on the cornea and covered the pupil and cosmetic problems [8]. Exposure to excessive measures of ultra-violet (UV) light is thought to be the principal significant reason for pterygium. They are more common in people who living in sunny region and in people whose jobs out door expose them to UV light (e.g. farmers, fishermen, labors bend welders) Often someone might not the formation of a pterygium but may not experience the other symptoms. If other symptoms are experienced, they will include: Eye redness and inflammation, a gritty or burning sensation within the eye, a feeling that there is a foreign object within the eye, dryness of the eye because of reduced tear production, blurring of vision if the transparent layer at the front of the eye (cornea) is distorted [9]. Pterygium cause corneal distortion and induce a significant amount of astigmatism. Astigmatism and surface phenomena in pterygium was studied and located increased astigmatism with the rule (greater than 0.5 D in 46%, ≥ 4 D in 13%) without associated impairment of vision [10]. The impact of pterygium on the corneal refractive status has

been estimated by refraction, keratometry and corneal geography [11]. A few components are proposed to explain the incited astigmatism. These include: (a) pooling of the tear film at the main edge of the pterygium.(b) mechanical traction exerted by the pterygium on cornea [12]. Studies show that in most of pterygium patients, localized flattening of the corneal curvature and mostly occurs at horizontal meridian , which results in with-the-rule astigmatism [13]. Astigmatism created because of pterygium just as attack of the visual axis and limitation of average rectus muscle because of pterygium, may affect the visual acuity essentially and cause blurring of vision [14]. In pterygium considering the way that smoothing of periphery cornea is more than central cornea; in this manner the keratometry which appraises only the central cornea can prompt questionable results [15].

M E T H O D O L O G Y

It was an observational study conducted at The Layton Rahmatulla Benevolent Trust (LRBT) eye Hospital Multan Road, Lahore from January to March, 2021. Total of 50 patients were included in this study and non- probability convenient sampling technique was utilized. With ethical approval data were collected by examining the patients with pen torch and grades of pterygium were confirmed by slit lamp examination and then auto-refractometry reading was recorded to confirm the amount of astigmatism. Data collection was followed by analysis of data using SPSS version 25.0

R E S U L T S

A total of 50 patients with different grades of pterygium participants in this study were included, in which 31(62.0%) were male and remaining 19(38.0%) female. The patients from 15 to 24 years were 12 (24.0%), patients from 25 to 34 years were 11(22.0%), patients from 35 to 44 years were 14 (28.0%) and patients from 46 to 55 years were 13 (26.0%).VA without glasses from 6/6 to

6/24 were 21(42.0%) and 6/24 to 6/60 were 29(58.0%). VA with glasses from 6/6 to 6/24 were 28(56.0%) and 6/24 to 6/60 were 22(44.0%). 21(42.0%) of patients were having grade I pterygium, 21 (42.0%) were having grade II pterygium and 8(16.0%) were having grade III pterygium which covers the visual axis of eye. The amount of astigmatism varied in between the various grade of pterygium. In grade I there was 17 (34.0%) patients who were having 0.00DC to 1.00DC of astigmatism, 2(4.0%) patients who were having 1.00 DC to 2.00 DC and 2 (4.0%) patients were having 2.00DC to 4.00 DC power of

astigmatism. In grade II there was 10 (20.0%) patients who were having 1.00 DC to 2.00 DC, 10 (20.0%) patients who were having 2.00 DC to 4.00 DC and 1 (2.0%) patient who were having Greater than 4.00DC power of astigmatism. In grade III there was 2 (4.0%) patients who were having 1.00DC to 2.00 DC, 4 (8.0%) patients who were having 2.00 DC to 4.00 DC and 2(4.0%) patients who are having greater than 4.00DC power of astigmatism (Table 1).

Grade of pterygium	Amount of astigmatism				Chi-square	p-value
	0.00DC to 1.00DC	1.00DC to 2.00DC	2.00DC to 4.00DC	Greater than 4.00DC		
	N (%)	N (%)	N (%)	N (%)	40.80	<.001
Grade 1	17(34.0%)	2(4.0%)	2(4.0%)	0		
Grade 2	0	10(20.0%)	10(20.0%)	1(2.0%)		
Grade 3	0	2(4.0%)	4(8.0%)	2(4.0%)		
Total	17(34.0%)	14((28.0%)	16(32.0%)	3(6.0%)		

Table 1: Grades of pterygium and amount of astigmatism

DISCUSSION

A pterygium generally causes localized flattening central to the apex of the pterygium. This diseases spread across the world and prevalence is more common in nations situated close to the equator. It causes blur vision if cannot treat in early stages it can lead visual impairment in the affected eyes. The present study was conducted to determine the relation of different grades of pterygium and amount induced corneal astigmatism. A total 50 patients presenting unilateral pterygium were included in this study, attending LRBT Eye Hospital Multan road, Lahore were selected in the study. This study was conducted in Gondar city from April 15 to May 7, 2016. The current investigation reports that the females were more affected with pterygium as compared to male these discoveries are as per the discoveries of different examinations [16]. A study

was conducted by 3 population-based studies of Malays, Indians, and Chinese persons 40 years of age and older conducted between 2004 and 2011[17]. Females are more aware as compared to males, while there are some different investigations that invalidate the result of our examination. This study the prevalence of male are more than female which increase environment insults because outdoor work are more like to be male. A portion of the reason reported are exposure to UV rays, dust and instability of tear film playing an important role in development of pterygium are very common in the age above 40 years because of physiological changes in the corneal epithelium [18-20].

Our study computed the relation between different grades of pterygium and induced amount of corneal astigmatism. The increasing size of a pterygium results in increased of curvature and irregularity of the cornea lead to astigmatism.

These findings are similar to a study in conducted in Germany [21]. The findings highlight the importance of good follow up care for patients with pterygium and decision for surgical excision before it causes significant visual loss due to induced astigmatism.

REFERENCES

- [1] Shah SI, Shah SA, and Rai P, (2016). Factors associated with pterygium based on history and clinical examination of patients in Pakistan. *J Curr Ophthalmol*, **28**(2): 91-2. doi: 10.1016/j.joco.2016.03.005
- [2] Oldenburg JB, et al., (1990). Conjunctival pterygia. Mechanism of corneal topographic changes. *Cornea*, **9**(3): 200-204.
- [3] Gupta VP and Saxena T (2003). Comparison of single-drop mitomycin C regime with other mitomycin C regimes in pterygium surgery. *Indian Journal of Ophthalmology*, **51**(1): 59. https://journals.lww.com/ijo/Fulltext/2003/51010/Comparison_of_Single_drop_Mitomycin_C_Regime_with.10.aspx
- [4] Alpay A, Uğurbaş SH and Erdoğan B (2009). Comparing techniques for pterygium surgery. *Clinical ophthalmology (Auckland, NZ)*, **3**: 69. <https://pubmed.ncbi.nlm.nih.gov/19668546/>
- [5] Kamil Z, Bokhari SA and Rizvi F, (2011). Comparison of conjunctival autograft and intra-operative application of mitomycin-C in treatment of primary pterygium. *Pakistan Journal of Ophthalmology*, **27**(4). <http://www.pjo.com.pk/27/4/zeeshan%20Akmil%2010.pdf>
- [6] Taylor, H.R., et al., (1992). The long-term effects of visible light on the eye. *Archives of ophthalmology*, **110**(1): 99-104. doi: 10.1001/archopht.1992.01080130101035
- [7] Kodavoor, S.K., et al., (2017). Double-head pterygium excision with modified vertically split-conjunctival autograft: Six-year long-term retrospective analysis. *Indian journal of ophthalmology*, **65**(8): 700. doi: 10.4103/ijo.IJO_284_17
- [8] De Keizer R, (1982). Pterygium excision with or without postoperative irradiation, a double-blind study. *Documenta Ophthalmologica*, **52**(2): 309-315. doi: 10.1007/BF01675860
- [9] Alam A, et al., (2015). Comparison of pterygium resection with conjunctival auto graft versus amniotic membrane graft. *Pakistan Journal of Ophthalmology*, **31**(4).
- [10] Hansen A and Norn M, (1980). Astigmatism and surface phenomena in pterygium. *Acta ophthalmologica*, **58**(2): 174-181. doi: 10.1111/j.1755-3768.1980.tb05706.x
- [11] Yousuf M, (2005). Role of pterygium excision in pterygium induced astigmatism. *JK-Practitioner*, **12**(2): 91-92.
- [12] Ergin A and Bozdoğan Ö, (2001). Study on tear function abnormality in pterygium. *Ophthalmologica*, **215**(3): 204-208. doi.org/10.1159/000050859
- [13] Jain AK and Pandey DJ, (2020). Evaluation of change in pterygium induced keratometric astigmatism in patients following pterygium excision with autologous graft surgery. *Nepalese Journal of Ophthalmology*, **12**(2): 191-200. doi: 10.3126/nepjoph.v12i2.28287
- [14] Mahar P and Manzar N, (2014). Risk factors involved in pterygium recurrence after surgical excision. *Pakistan Journal of Ophthalmology*, **30**(2). <http://www.pjo.com.pk/30/2/4.P.S%20Mahar.pdf>
- [15] Sharjeel M, Ali F and Malik IQ, (2016). Frequency of Pterygium Recurrence with Limbal Stem Cell Autograft. *Pakistan Journal of Ophthalmology*, **32**(4). <http://www.pjo.com.pk/32/4/5.%20A-Muhammad%20%20Sharjeel%20reviewed.pdf>
- [16] Anbesse DH, et al., (2017). Prevalence and associated factors of pterygium among adults living in Gondar city, Northwest

- Ethiopia. *PLOS ONE*, **12**(3): e0174450. doi: 10.1371/journal.pone.0174450
- [17] Ang M, et al., (2012). Prevalence of and racial differences in pterygium: a multiethnic population study in Asians. *Ophthalmology*, **119**(8): 1509-1515. doi: 10.1016/j.ophtha.2012.02.009
- [18] Malekifar P, et al., (2017). Risk factors for pterygium in Ilam Province, Iran. *Journal of Ophthalmic & Vision Research*, **12**(3): 270. doi: 10.4103/jovr.jovr_85_16
- [19] Gazzard G, et al., (2002). Pterygium in Indonesia: prevalence, severity and risk factors. *British Journal of Ophthalmology*, **86**(12): 1341-1346. doi: 10.1136/bjo.86.12.1341
- [20] Yasar T, et al., (2003). Effects of fibrovascular traction and pooling of tears on corneal topographic changes induced by pterygium. *Eye*, **17**(4): 492-496. doi: 10.1038/sj.eye.6700377
- [21] Han SB, et al., (2016). Quantification of astigmatism induced by pterygium using automated image analysis. *Cornea*, **35**(3): 370-376. doi: 10.1097/ICO.0000000000000728