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Original Research Article

EVALUATION OF PREVALENCE OF KERATOGLOBUS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Keratoglobus is an uncommon, non-inflammatory ectatic disorder of the cornea, and shares morphological and clinical similarities with other non-inflammatory thinning disorders such as keratoconus and pellucid marginal degeneration, which has led researchers to hypothesize about overlapping mechanisms of disease. Hence; the present study was conducted to evaluate prevalence of keratoglobus at a tertiary care hospital. **Materials and Methods:** A total of 1000 clinical records were randomly selected. The study specifically focused for the early detection and progression of keratoglobus. To systematically collect and manage data, a database was created. This database included essential patient details such as identification number, sex, age, primary diagnoses at the initial clinic consultation, along with refractive status and visual acuity measurements for both eyes. Refraction assessments were carried out using skiascopy under cycloplegia, ensuring accuracy in identifying refractive errors. All the results were assessed using SPSS software. **Result:** Out of 1000 patient records analyzed, 23 individuals (2.3%) were diagnosed with keratoglobus, while the remaining 977 patients (97.7%) did not present with the condition. This distribution was statistically significant ($p = 0.00$), highlighting that keratoglobus tends to manifest at a younger age. Among patients with keratoglobus, 7 had a positive family history of ocular disorders, while 16 reported no such history. Findings suggest that irregular astigmatism is a predominant refractive feature associated with keratoglobus. **Conclusion:** Keratoglobus was found to be an uncommon corneal disorder with higher occurrence in younger individuals, particularly under 20 years of age. These findings emphasize the importance of early detection and refractive evaluation in younger patients to facilitate timely diagnosis and management of keratoglobus.

INTRODUCTION

Keratoglobus is an uncommon, non-inflammatory ectatic disorder of the cornea, distinguished by diffuse corneal thinning and a globular outward protrusion of the corneal surface. This condition was first delineated as a distinct clinical entity by Verrey in 1947. It can manifest in both congenital and acquired forms, with the former often presenting in early life and the latter sometimes linked to ocular trauma, chronic eye disease, or systemic abnormalities. Importantly, keratoglobus has been documented in association with connective tissue disorders such as Ehlers–Danlos and Marfan syndrome, suggesting a systemic component to its pathogenesis.[1,2]

The condition shares morphological and clinical similarities with other non-inflammatory thinning disorders such as keratoconus and pellucid marginal degeneration, which has led researchers to hypothesize about overlapping mechanisms of disease. Despite these parallels, the precise genetic underpinnings and molecular pathways responsible for keratoglobus remain poorly defined, leaving its aetiopathogenesis largely speculative.[3,4] Clinically, patients typically present with a progressive reduction in visual acuity due to marked irregular astigmatism and altered corneal topography. The extreme thinning significantly compromises the biomechanical strength of the cornea, predisposing it to fragility, rupture, and perforation even with minor trauma. As a result, keratoglobus poses a dual challenge: progressive visual deterioration on one hand and structural vulnerability of the cornea on the other, making early recognition and careful management essential.[5,6] Hence; the present study was conducted to evaluate prevalence of keratoglobus at a tertiary care hospital.

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MATERIALS AND METHODS

This investigation was designed as a clinical study aimed at determining the prevalence of keratoconus within a defined patient population. A total of 1000 clinical records were randomly selected. The study specifically focused for the early detection and progression of keratoglobus. To systematically collect and manage data, a database was created. This database included essential patient details such as identification number, sex, age, primary diagnoses at the initial clinic consultation, along with refractive status and visual acuity measurements for both eyes. Refraction assessments were carried out using skiascopy under cycloplegia, ensuring accuracy in identifying refractive errors. Descriptive statistical methods were employed to analyze prevalence rates and mean values of the recorded variables. As the study was intended to provide a broad overview of keratoglobus occurrence, no exclusion criteria were applied, thereby allowing for an inclusive representation of the study cohort. This methodological approach was designed to enhance the reliability of prevalence estimation and capture the variability within the population. All the results were subjected to statistical analysis using SPSS software.

RESULTS

Out of 1000 patient records analyzed, 23 individuals (2.3%) were diagnosed with keratoglobus, while the remaining 977 patients (97.7%) did not present with the condition. This indicates that keratoglobus is relatively rare in the studied population. When stratified by sex, 8 males and 15 females were found to have keratoglobus. Although the prevalence appeared slightly higher in females, statistical analysis showed no significant association between gender and keratoglobus ($p = 0.07$). Thus, both sexes were almost equally susceptible to the disorder. A strong correlation was observed between age and the presence of keratoglobus. The condition was most prevalent in individuals below 20 years of age (12 cases), followed by those aged 20–40 years (8 cases), and only 3 cases were detected in patients over 40 years. This distribution was statistically significant ($p = 0.00$), highlighting that keratoglobus tends to manifest at a younger age. Among patients with keratoglobus, 7 had a positive family history of ocular disorders, while 16 reported no such history. However, statistical testing revealed no significant relationship between family history and the occurrence of keratoglobus ($p = 0.72$), suggesting that hereditary factors may not play a dominant role in this cohort. Analysis of refractive errors among patients with keratoglobus showed that compound myopic astigmatism was the most common refractive error, observed in 9 cases (39.13%). This was followed by simple myopia (6 cases, 26.09%), simple myopic astigmatism (5 cases, 21.74%), and mixed astigmatism (3 cases, 13.04%). These findings suggest that irregular astigmatism is a predominant refractive feature associated with keratoglobus.

Table 1: Prevalence of Keratoglobus

Keratoglobus	Number	Percentage
Present	23	2.3
Absent	977	97.7
Total	1000	100

Table 2: Correlation of Keratoglobus with gender

Gender	Keratoglobus Present	Keratoglobus Absent
Males	8	524
Females	15	453
Total	23	977
p-value	0.07	

Table 3: Correlation of Keratoglobus with age group

Age group (years)	Keratoglobus Present	Keratoglobus Absent
Less than 20	12	385
20 to 40	8	301
More than 40	3	291
Total	23	977
p-value	0.00 (Significant)	

Table 4: Correlation of Keratoglobus with family history

Variable	Keratoglobus Present	Keratoglobus Absent
Positive family history	7	517
Negative family history	16	460
Total	23	977
p-value	0.72	

Table 5: Refractive errors

Refractive errors	Number	Percentage
Simple Myopia	6	26.09
Compound Myopic Astigmatism	9	39.13
Simple Myopic Astigmatism	5	21.74

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Mixed Astigmatism	3	13.04
Total	23	100

DISCUSSION

Keratoglobus is a rare, non-inflammatory ectatic corneal disorder characterized by diffuse corneal thinning and a globular protrusion of the cornea. Its precise etiology remains unclear, with the condition often considered the final outcome of multiple pathological processes. Recent advances in corneal imaging and the widespread use of refractive surgery have facilitated earlier recognition of keratoglobus compared to earlier decades.[7-9] Consequently, the present study sought to evaluate the prevalence and clinical profile of keratoglobus in a tertiary care hospital setting.

In the current study, keratoglobus was diagnosed in 2.3% of patients, underscoring its rarity. Although a slightly higher prevalence was observed in females, the difference was not statistically significant, suggesting no clear gender predilection. Age distribution showed a strong predilection for younger individuals, with over half of the cases occurring before 20 years of age. This finding aligns with existing literature indicating that keratoglobus often presents in childhood or early adulthood.

Our results parallel the findings of Rathi et al,[10] who analyzed 48 patients (mean age 22 ± 15 years, 31 males) with keratoglobus. In their series, 42 eyes belonged to patients under 16 years of age, with clinical signs including corneal scarring, hydrops, and globe rupture. Visual outcomes were generally poor, with best-corrected visual acuity (BCVA) >20/40 achieved in only 14.3% of pediatric and 28.3% of adult eyes. Similarly, Cameron et al,[11,12] reported 23 patients (12 adults, 11 pediatric), noting that males outnumbered females by a ratio of 2:1. Bilaterality was common, although unilateral involvement was occasionally reported. Cases of phthisis bulbi following trivial trauma were also described, reflecting the extreme fragility of the ectatic cornea.

The diagnosis of keratoglobus is essentially clinical, supported by investigative modalities where possible. Ultrasonic pachymetry typically reveals generalized thinning, while topographic imaging such as Orbscan (TECHNOLAS Perfect Vision GmbH, Munich, Germany) demonstrates diffuse corneal thinning.[13] In advanced cases, however, severe distortion may limit imaging accuracy. Literature describing characteristic topographic features is sparse. Karabatsas and Cook,[14] reported a case of keratoglobus with coexisting pellucid marginal degeneration (PMD), where videokeratography showed irregular astigmatism, with a peripheral arc of steepening causing distortion of the classic bow-tie pattern. This was interpreted as circumferential progression of PMD-associated thinning.

Our study further supports previous observations that irregular astigmatism is the hallmark refractive error in keratoglobus, with compound myopic astigmatism being the most common pattern. While familial predisposition has been suggested in some reports, our findings showed no statistically significant correlation between positive family history and keratoglobus occurrence, suggesting that environmental or idiopathic factors may play a more dominant role in this population

CONCLUSION

Keratoglobus was found to be an uncommon corneal disorder with higher occurrence in younger individuals, particularly under 20 years of age. No significant associations were observed with gender or family history, while compound myopic astigmatism emerged as the most frequent refractive error among affected patients. These findings emphasize the importance of early detection and refractive evaluation in younger patients to facilitate timely diagnosis and management of keratoglobus.

REFERENCES

1. Verrey F. Keratoglobe aigu. Ophthalmologica. 1947;114:284–288.
2. Cavara V. Keratoglobus and keratoconus: a contribution to the nosological interpretation of keratoglobus. Br J Ophthalmol. 1950;34:621–626.
3. Gregoratos ND, Bartsocas CS, Papas K. Blue sclerae with keratoglobus and brittle cornea. Br J Ophthalmol. 1971;55(6):424–426. doi:10.1136/bjo.55.6.424.
4. Nelson ME, Talbot JF. Keratoglobus in Rubinstein-Taybi syndrome. Br J Ophthalmol. 1989;73(5):385–387. doi:10.1136/bjo.73.5.385.
5. Biglan AW, Brown SI, Johnson BL. Keratoglobus and blue sclera. Am J Ophthalmol. 1977;83(2):225–233. doi:10.1016/0002-9394(77)90621-3.
6. Cameron JA, Cotler JB, Risco JM, Alvarez H. Epikeratoplasty for keratoglobus associated with blue sclera. Ophthalmology. 1991;98(4):446–452.
7. Cameron JA. Corneal abnormalities in Ehlers-Danlos syndrome type VI. Cornea. 1993;12(1):54–59.
8. Jacobs DS, Green WR, Maumenee AE. Acquired keratoglobus. Am J Ophthalmol. 1974;77(3):393–399.
9. Baillif S, Garweg JG, Grange JD, Burillon C, Kodjikian L. Keratoglobus: review of the literature. J Fr Ophtalmol. 2005;28(10):1145–1149.
10. Rathi VM, Murthy SI, Bagga B, Taneja M, Chaurasia S, Sangwan VS. Keratoglobus: An experience at a tertiary eye care center in India. Indian J Ophthalmol. 2015 Mar;63(3):233-
11. Cameron JA. Keratoglobus. Cornea. 1993;12:124–30.
12. Cameron JA, Cotter JB, Risco JM, Alvarez H. Epikeratoplasty for keratoglobus associated with blue sclera. Ophthalmology. 1991;98:446–52
13. Wallang BS, Das S. Keratoglobus. Eye (Lond). 2013 Sep;27(9):1004-12.
14. Karabatsas CH, Cook SD. Topographic analysis in pellucid marginal corneal degeneration and keratoglobus. Eye. 1996;10

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