

Clinical Spectrum and Management of Glaucoma in Pseudoexfoliation Syndrome

Yash Rajubhai Gandhi¹, Rohit Kumar Yogi², Trupti Arvindbhai Bhesaniya³

¹Assistant Professor, Department of Ophthalmology, Ananta Institute of Medical Science and Research Centre, Rajsamand, Rajasthan, India

²Assistant Professor, Department of Ophthalmology, Ananta Institute of Medical Science and Research Centre, Rajsamand, Rajasthan, India

³Assistant Professor, Department of Ophthalmology, Government Medical College, Surat, Gujarat, India

Received: 20-01-2023 / Revised: 11-02-2023 / Accepted: 05-03-2023

Corresponding author: Dr. Yash Rajubhai Gandhi

Conflict of interest: Nil

Abstract:

Background and Aim: One of the most widespread causes of secondary open angle glaucoma in the world is pseudoexfoliation. The present study is conducted to determine the clinical profiles with pseudoexfoliation syndrome. Hence the present study was done with the aim to document the prevalence of ocular clinical profile of pattern in patients with pseudo-exfoliative material attending general ophthalmology outpatient department of a tertiary care hospital.

Material and Methods: In the present analysis a total of 48 patients, who attended the outpatient department of ophthalmology, medical college and hospital and were diagnosed with pseudoexfoliation were investigated. The visual acuity was assessed using the Snellen chart for visual acuity. Pseudoexfoliation glaucoma was diagnosed on the basis of pseudoexfoliative material on slit lamp examination, IOP>21 mm Hg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, glaucomatous field defects on perimetry.

Results: Age range of 61–70 years had the highest occurrence of pseudoexfoliation, accounting for 23, followed by 51–60 years with 17 cases. In the 48 individuals included in the current investigation, 20 patients had bilateral pseudoexfoliation and 28 patients had unilateral pseudoexfoliation. Our analysis revealed that 17 patients had elevated intraocular pressure. Our analysis of 48 cases revealed that 15 had open angle glaucoma and 2 had narrow angle glaucoma. 11 men and 4 women made up the group of 15 patients with open angle glaucoma.

Conclusion: pseudoexfoliation is more common as people age and that it is typically unilateral when it first manifests but gradually develops into bilateral pseudoexfoliation, necessitating frequent follow-up in unilateral cases. Pseudoexfoliation has a higher glaucoma incidence, and the majorities have open angles.

Keywords: Fundus, Intraocular Pressure, Open Angle Glaucoma, Pseudoexfoliation.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

A senile systemic microfibrilopathy known as pseudoexfoliation (PXF) is characterized by the accumulation of gray-white fibrogranular extracellular material that is generated by defective basement membranes of ageing epithelial cells. The most distinctive ocular characteristic that supports the diagnosis is the appearance of pseudoexfoliative material (PEX) that resembles dandruff on various areas of the lens, pupil, or cornea. The pathophysiology of the illness is yet unknown, and PEX development is thought to be caused by a variety of variables, including genetic, environmental, and dietary factors.[1,2] On the anterior lens capsule, the lens frequently exhibits a "three-ring sign" that consists of a clear zone in the

middle, a rather homogeneous central zone, and a granular foggy periphery zone. The most significant and obvious diagnostic indicator of pseudoexfoliation is whitish-grey flaky debris on the anterior side of the lens or on the pupillary border of the iris. The diagnosis is supported by pigment loss from the iris sphincter region and its deposition on structures in the anterior chamber.[3,4] One of the main causes of permanent blindness in the world is glaucoma. One of the most widespread causes of secondary open angle glaucoma in the world is pseudoexfoliation. The disease is recognized to be more aggressive and to proceed at a mean rate that is higher than that of primary open angle glaucoma.[5-7]

The rise in intraocular pressure in pseudoexfoliation syndrome is typically painless and symptomless. For the majority of patients, it causes a delay in the diagnosis of pseudoexfoliation syndrome. Pseudoexfoliation syndrome risk can rise with delayed diagnosis. Around the world, the prevalence of pseudoexfoliation syndrome in people over 60 years of age ranges from 10 to 20%. According to age, gender, race, ethnicity, and population, pseudoexfoliation syndrome is more common in some groups than others. Pseudoexfoliation syndrome is more common as people age. Therefore, it is widespread among seniors.[8,9] The present study is conducted to determine the clinical profiles with pseudoexfoliation syndrome. Hence the present study was done with the aim to document the prevalence of ocular clinical profile of pattern in patients with pseudo-exfoliative material attending general ophthalmology outpatient department of a tertiary care hospital.

Materials and Methods

In the present analysis a total of 48 patients, who attended the outpatient department of ophthalmology, medical college and hospital and were diagnosed with pseudoexfoliation were investigated. The institute ethical committee was informed about the study and the clearance certificate was obtained prior to the start of the study. The included patients were informed in detail about the study and the consent was obtained in the local language and signed. Those who refused to provide signature were excluded from the study.

The exclusion and inclusion criteria were as follows:

Inclusion Criteria:

- a) Every patient diagnosed with pseudoexfoliation syndrome between the ages of 40 and 80.
- b) Both men and women were represented. Inclusion of unilateral and bilateral pseudoexfoliation cases.

Exclusion Criteria:

- a) Patients who are under 40 years old.
- b) A patient who has experienced uveitis or ocular injuries in the past
- c) Patients who have a history of working with hot infrared lights, such as when blowing glass.
- d) A patient who was taking medication and had been diagnosed with POAG and angle closure glaucoma.

The case performa was created with the assistance of two subject-matter experts. All of the patients' comprehensive histories and demographic

breakdowns were documented. A thorough clinical visual examination was performed and recorded. The visual acuity was assessed using the Snellen chart for visual acuity. Slit lamp biomicroscopy was used to do the further examination. A Goldmann applanation tonometer was used to assess the intraocular pressure.

After the CCT had been corrected, the values were taken. To prevent inter-observer discrepancies, the entire eye examination and measurements were performed by a single person. Pseudoexfoliation glaucoma was diagnosed on the basis of pseudoexfoliative material on slit lamp examination, IOP>21 mm Hg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, glaucomatous field defects on perimetry.

Results

The total of 48 patients with pseudoexfoliation was included in the current investigation. There were 21 female patients and 27 male ones. According to age groups, the patients that were included were divided. It was shown that the age range of 61–70 years had the highest occurrence of pseudoexfoliation, accounting for 23, followed by 51–60 years with 17 cases. In our investigation, the patient with the youngest age was 42, and the patient with the oldest age was 80.

There were 27 men and 21 women out of the 48 patients in the current study had pseudoexfoliation. In our investigation, a slight male preponderance was found. In the 48 individuals included in the current investigation, 20 patients had bilateral pseudoexfoliation and 28 patients had unilateral pseudoexfoliation. Bilateral pseudoexfoliation was less common; unilateral pseudoexfoliation was more common.

In the present analysis 28 patients were found to have unilateral pseudoexfoliation, and they were at risk for getting it in the other eye. Therefore, patients with unilateral pseudoexfoliation require ongoing monitoring. Both unilateral and bilateral pseudoexfoliation occurred often in the 61–70 year age range in this examination of 28 patients. There were 20 individuals with bilateral pseudoexfoliation, and 11 of them were between the ages of 61 and 70. Two of the four patients in the 71–80 year old age range showed bilateral pseudoexfoliation. In the years 71 to 80, the proportion of bilateral pseudoexfoliation was greater. This shows that as people age, bilateral pseudoexfoliation becomes more common.

Out of 48 participants in this study, 17 people had glaucoma. According to this study, 36% of individuals have glaucoma. Glaucoma is more common as people age. The age range of 61 to 70 years sees the highest number of glaucoma

sufferers. The likelihood of developing glaucoma increases with age in those with pseudoexfoliation compared to younger individuals.

In the 48 patients in our study, 30 had intraocular pressure less than 20 mmHg, 11 had intraocular pressure between 21 and 30 mmHg, and 7 had intraocular pressure over 30 mmHg. Our analysis revealed that 17 patients had elevated intraocular pressure. Our study found that 28% of patients had serious damage to the optic disc (>0.6), which is higher than the patient population without pseudoexfoliation (18%). Thus, pseudoexfoliation severely harms the optic nerve and results in vision

loss. Our analysis of 48 cases revealed that 15 had open angle glaucoma and 2 had narrow angle glaucoma. 11 men and 4 women made up the group of 15 patients with open angle glaucoma.

As a result, the findings indicated that pseudoexfoliation glaucoma is frequent in men. Angle closure glaucoma is less common than open angle glaucoma, according to our research on pseudoexfoliation syndrome. The mechanism of the rise in IOP in pseudoexfoliation and the prevalence of POAG explains this. 48 patients were evaluated, and 3 had diabetes mellitus, 2 had hypertension, and 1 had a cardiovascular condition.

Table 1: Age distribution of patients included in the study

Age in years	No. of patients	Patients with glaucoma
41 – 50	3	0
51 – 60	17	6
61 – 70	23	9
71 - 80	5	2

Discussion

Because vision loss from glaucoma happens gradually over time and doesn't show symptoms until the disease is far along, early detection is the best form of defence.[10] In this study, 48 patients with pseudoexfoliation who visited our facility were evaluated in detail for age at presentation, gender, laterality, glaucoma association, type of glaucoma, and treatment response.

In our study, people 61 to 70 years old frequently experience pseudoexfoliation syndrome. According to the Framingham study, pseudoexfoliation occurs more frequently as people get older. The question of whether PEX is an accidental discovery or the true cause of open-angle glaucoma is still up for debate. According to the majority of research, glaucoma risk increases over time and is a normal aspect of the disease's progression.

However, a prospective 10-year follow-up research with individuals who had clinically unilateral PEX revealed that glaucoma could manifest in the opposite eyes prior to any clinical PEX symptoms. It was discovered that the initial IOP, degree of pupillary dilatation, and differential in pressure between the colleague eyes all affected the relative risk of conversion to glaucoma.[11] When POAG is initially diagnosed in an eye, signs of PEX syndrome frequently develop later.

It is unclear if this is the result of a misdiagnosis made by a clinician or the coincidence of two distinct illnesses. It is conceivable that an underlying defect in aqueous humor dynamics or additional involvement of a "glaucoma susceptibility gene" may predispose for glaucoma development in PEX eyes.[12]

Bilateral glaucoma is less frequent in our study than unilateral glaucoma. Therefore, the most frequent cause of unilateral secondary open angle glaucoma is pseudoexfoliation. In our study, 25% of patients had a cup disc ratio greater than 0.6. Therefore, compared to POAG, pseudoexfoliation causes more damage to the optic nerve. Thirty patients in our study had intraocular pressure (IOP) less than 20 mm Hg, eleven patients had IOP between 21 and 30 mm Hg, and the remaining seven patients had IOP greater than 30 mm Hg.

Conclusion

It was discovered that pseudoexfoliation is more common as people age and that it is typically unilateral when it first manifests but gradually develops into bilateral pseudoexfoliation, necessitating frequent follow-up in unilateral cases. Pseudoexfoliation has a higher glaucoma incidence, and the majorities have open angles.

Bilateral pseudoexfoliation is more common than unilateral pseudoexfoliation in terms of glaucoma. More people have unilateral glaucoma than bilateral glaucoma.

References

1. Dhakne V. R., Karad S. H., Karad H. T., Waghambare S. B., Karad M. T., Nisale U. H., Pujar R. S., Ambade H. S. Ocular Clinical Spectrum of Pseudoexfoliation in Cataract Patients at a Tertiary Eye Care Centre in Rural Maharashtra—A Cross Sectional Study. 2021.
2. Jeng S. M., Karger R. A., Hodge D. O., Burke J. P., Johnson D. H., Good, M. S. J. J. O. G. The risk of glaucoma in pseudoexfoliation syndrome. 2007; 16: 117-121.

3. Liu W., Huang D., Guo R., Ji J. J. J. O. O. Pathological changes of the anterior lens capsule. 2021; 1-5.
4. Desai M. A., Lee R. K. J. I. O. C. The medical and surgical management of pseudoexfoliation glaucoma. 2008; 48: 95.
5. Weinreb R. N., Aung T., Medeiros F. A. J. J. The pathophysiology and treatment of glaucoma: a review. 2014; 311: 1901-1911.
6. Metgud R., Naik S., Patel S. J. J. O. C. R. Therapeutics. Spindle cell lesions: A review on immunohistochemical markers. 2017; 13: 412-418.
7. Tuteja S., Chawla H. J. A. Pseudoexfoliation Syndrome and Glaucoma. 2023; 26: 33.
8. Kamel K., Farrell M., O'Brien C. J. M. Mitochondrial dysfunction in ocular disease: focus on glaucoma. 2017; 35: 44-53.
9. Arévalo-López C., Gleitze S., Madariaga S., Plaza-Rosales I. J. I. O. Pupillary response to chromatic light stimuli as a possible biomarker at the early stage of glaucoma: a review. 2023; 43: 343-356.
10. Quigley H. J. H.R. Glaucoma: what every patient should know. Part 1. What is Glaucoma and how did you get it? 2014;13: 69-76.
11. Henry J. C., Krupin T., Schmitt M., Lauffer J., Miller E., Ewing M. Q., Scheie H. G. J. O. Long-term follow-up of pseudoexfoliation and the development of elevated intraocular pressure. 1987; 94 545-552.
12. Wairagade N., Mahatme V., Chipure P., Pande C., Singare R., Pawar M. J. J. O. E. O. M., Sciences, D. Impact of age, gender, pre-operative intra ocular pressure and anterior chamber depth on the outcome of phacoemulsification procedure in pseudoexfoliation syndrome. 2015; 4 1493-1501.