

Clinical spectrum and management of pseudoexfoliation syndrome: A cross-sectional study



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ABSTRACT

Background: Pseudoexfoliation is one of the most common causes of secondary open-angle glaucoma worldwide. The current investigation is being carried out to investigate the clinical characteristics associated with pseudoexfoliation syndrome. **Aims and Objectives:** The current study was conducted with the goal of documenting the prevalence of the ocular clinical profile of patterns in patients with pseudo-exfoliative material attending a tertiary care hospital's general ophthalmology outpatient department. **Materials and Methods:** In the current study, 100 individuals were explored who were diagnosed with pseudoexfoliation and attended the outpatient department of ophthalmology, medical college, and hospital. The Snellen chart for visual acuity was used to test visual acuity. Pseudoexfoliation glaucoma was identified based on slit lamp examination of pseudoexfoliative material, intraocular pressure (IOP) >21 mmHg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, and glaucomatous field abnormalities on perimetry. **Results:** The age range of 61–70 years had the most cases of pseudoexfoliation, accounting for 23, followed by 51–60 years with 17 occurrences. The current study comprised 48 patients, 20 of whom had bilateral pseudoexfoliation and 28 of whom had unilateral pseudoexfoliation. Our findings revealed that 17 patients had high IOP. We discovered 15 cases of open-angle glaucoma and 2 cases of narrow-angle glaucoma after analyzing 48 patients. The sample of 15 individuals with open-angle glaucoma included 11 men and 4 women. **Conclusion:** Pseudoexfoliation becomes more common as people age, and it is often unilateral at first but progressively progresses to bilateral pseudoexfoliation, necessitating frequent follow-up in unilateral cases. Pseudoexfoliation is associated with an increased risk of glaucoma, and the majority of cases have open angles.

Key words: Fundus; Intraocular pressure; Open angle glaucoma; Pseudoexfoliation

INTRODUCTION

Pseudoexfoliation syndrome (PXF) is a senile systemic microfibrilopathy characterized by the accumulation of gray-white fibrogranular extracellular material produced by faulty basement membranes of aged epithelial cells. The presence of pseudoexfoliation syndrome (PEX) that mimics dandruff on various parts of the lens, pupil, or cornea is the most distinguishing ocular trait that confirms the diagnosis. The illness's pathogenesis is uncertain, and PEX development is assumed to be caused by a number

of causes, including genetic, environmental, and nutritional factors.^{1,2}

The lens frequently exhibits a “three-ring sign” on the anterior lens capsule, which consists of a clear zone in the middle, a very uniform central zone, and a granular hazy perimeter zone. The presence of whitish-grey flaky debris on the anterior side of the lens or on the pupillary border of the iris is the most significant and evident diagnostic evidence of pseudoexfoliation. Pigment loss from the iris sphincter region and its deposition

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on components in the anterior chamber confirm the diagnosis.^{3,4}

Glaucoma is one of the leading causes of permanent blindness worldwide. Pseudoexfoliation is one of the most common causes of secondary open-angle glaucoma worldwide. The illness is known to be more aggressive and to progress at a faster rate than primary open-angle glaucoma.^{5,6}

PXF causes an increase in intraocular pressure (IOP) that is usually painless and symptomless. It causes a delay in the diagnosis of PXF in the majority of patients. The risk of PXF increases with a delayed diagnosis. The prevalence of PXF in adults over the age of 60 ranges from 10% to 20% worldwide. PXF is more common in some groups than others, depending on age, gender, race, ethnicity, and population. PXF becomes more common as people get older. As a result, it is common among the elderly.⁷ The current investigation is being carried out to investigate the clinical characteristics associated with PXF. As a result, the current study was conducted with the goal of documenting the prevalence of the ocular clinical profile of pattern in patients with pseudo-exfoliative material attending a tertiary care hospital's general ophthalmology outpatient department.

Aims and objectives

The present study aimed to establish the prevalence of ocular clinical profile of pattern in patients with pseudo-exfoliative material attending a general ophthalmology outpatient department at a tertiary care hospital.

MATERIALS AND METHODS

In the current study, 100 individuals were explored who were diagnosed with pseudoexfoliation and attended the outpatient department of ophthalmology, medical college, and hospital. The study was informed by the institute's ethical committee, and a clearance certificate was received prior to the start of the study. The enrolled patients were fully informed about the trial, and consent was obtained and signed in the local language. Those who refused to sign were barred from participating in the study.

The following were the exclusion and admission criteria:

Inclusion criteria

The inclusion criteria were as follows: any patient diagnosed with PXF between the ages of 40 and 80, men and women were both represented, and cases of unilateral and bilateral pseudoexfoliation were included.

Exclusion criteria

Exclusion criteria were as follows:

Patients under the age of 40, patients who have had uveitis or ocular injuries in the past, and patients who have worked with hot infrared lights in the past, such as while blowing glass.

Two subject-matter specialists assisted in the development of the case performa. The full histories and demographic breakdowns of all patients were documented. A comprehensive clinical visual examination was performed and documented. The Snellen chart for visual acuity was used to test visual acuity. Slit lamp biomicroscopy was used for the additional inspection. The IOP was measured using a Goldmann applanation tonometer.

The readings were obtained after the CCT had been adjusted. The complete eye examination and measurements were performed by a single individual to avoid inter-observer inconsistencies. Pseudoexfoliation glaucoma was identified based on slit lamp examination of pseudoexfoliative material, IOP >21 mmHg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, and glaucomatous field abnormalities on perimetry.

RESULTS

The current study comprised a total of 100 patients with pseudoexfoliation. There were 40 female and 60 male patients (Table 1). The patients who were included were separated into age groups. The age range of 61–70 years was shown to have the highest occurrence of pseudoexfoliation, accounting for 50 cases, followed by 51–60 years with 36 cases. The patient with the youngest age in our study was 42, and the patient with the oldest age was 79 (Table 2).

In the current study, out of 100 patients, 42 had bilateral pseudoexfoliation and 58 had unilateral pseudoexfoliation. Unilateral pseudoexfoliation was more common than bilateral pseudoexfoliation (Table 3).

In the current study, 58 patients were found to have unilateral pseudoexfoliation, putting them at risk of developing it in the opposite eye. As a result, patients with unilateral pseudoexfoliation require continued observation. In this study, both unilateral and bilateral pseudoexfoliation

Table 1: Gender-wise distribution of study participants

Gender	Number	Percentage
Male	60	60
Female	40	40
Total	100	100

Table 2: Age distribution of patients included in the study

Age in years	Total no of pseudoexfoliation	Patients with glaucoma n (%)	Patients without glaucoma n (%)
41–50	6	0	6 (100)
51–60	36	13 (36.11)	23 (63.8)
61–70	50	17 (34)	33 (66)
71–80	8	4 (50)	4 (50)

happened often in the 61–70 year age group. The proportion of bilateral pseudoexfoliation was higher, from 71 to 80. This demonstrates that bilateral pseudoexfoliation becomes increasingly common as people age.

In this study, 34 of the 100 patients had glaucoma. This study found that 34% of people have glaucoma. Glaucoma is more common as people age. Glaucoma affects the most people between the ages of 61 and 70. The likelihood of developing glaucoma increases with age in those with pseudoexfoliation compared to younger individuals.

In the 100 patients in our study, 60 had intraocular pressure <20 mmHg, 25 had intraocular pressure between 21 and 30 mmHg, and 15 had intraocular pressure over 30 mmHg. Our findings revealed that 40 patients had high intraocular pressure (Table 4).

Our study found that 25% of patients had serious damage to the optic disc (>0.6), which is higher than the patient population without pseudoexfoliation. Thus, pseudoexfoliation severely harms the optic nerve and results in vision loss (Table 5).

We discovered 30 cases of open-angle glaucoma and 4 cases of narrow-angle glaucoma after analyzing 100 patients. The sample of 30 individuals with open-angle glaucoma included 22 men and 8 women (Table 6). 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 PXF. The mechanism of the rise in IOP in pseudoexfoliation and the prevalence of POAG explain this. 100 patients were evaluated, and 7 had diabetes mellitus, 5 had hypertension, and 2 had a cardiovascular condition.

DISCUSSION

Pseudoexfoliation is the prevailing etiology of both open-angle and closed-angle glaucoma on a global scale. It is characterized by delayed dislocation of the crystalline and intraocular lenses, as well as zonular fragility. Pseudoexfoliation prevalence may differ considerably between regions and study designs. The majority of studies report a prevalence ranging from 0.69% to 23%. Within the Indian populace, the range was 0.69–3.8%.⁶

Table 3: Distribution of pseudoexfoliation patients

Pseudoexfoliation patients	Number	Percentage
Unilateral	58	58
Bilateral	42	42

Table 4: Intraocular pressure

IOP (mmHg)	No of patients	Percentage
<20	60	60
21–30	25	25
>30	9	15
Total	60	100

IOP: Intraocular pressure

Table 5: Optic nerve damage

CD ratio	No of patients	Percentage
0.3	45	44
0.4–0.6	30	30
>0.6	25	25
Total	100	100

Pseudoexfoliation has the potential to augment the intricacies associated with cataract surgery. Preventive measures are most effective when glaucoma is detected early due to the progressive nature of vision impairment and the delayed onset of symptoms.⁸

One hundred patients who presented to our clinic with pseudoexfoliation were subjected to a comprehensive evaluation of their age at presentation, gender, laterality, glaucoma association, glaucoma type, and treatment response as part of this study. Our research revealed that individuals between the ages of 61 and 70 were more susceptible to PXF. In their study, Philip et al.,⁹ conducted research with 529 participants, and the mean value (\pm SD) was 65.1 ± 8.0 . Aravind et al.,¹ conducted a study in which they examined a population of 108 subjects in South India. The mean value (\pm SD) was 64.7 ± 9.63 . The current findings are comparable to those of Shazly et al.,¹⁰ who examined 320 subjects and determined the mean \pm standard deviation to be 68.15 ± 8.16 years. As pseudoexfoliation is a syndrome associated with advancing age, its prevalence escalates with an individual's age.

There is ongoing debate regarding whether PEX was accidentally discovered or if it is the actual cause of

Table 6: Type of glaucoma

Type of glaucoma	Male		Female	
	No of patients	Percentage	No of patients	Percentage
Open angle	22	73.3	8	26.6
Angle closure	3	60	2	40

open-angle glaucoma. The prevailing body of research suggests that an increased risk of developing glaucoma is a customary progression of the condition. A prospective 10-year follow-up study with individuals who had clinically unilateral PEX revealed that glaucoma could develop in the contrarily affected eye before the onset of clinical PEX symptoms. The initial intraocular pressure, degree of pupillary dilatation, and pressure differential between the eyes of colleagues were all found to elevate the relative risk of glaucoma conversion, it was disclosed.¹¹

After the initial detection of POAG in the eye, symptoms of PEX syndrome generally manifest subsequently. Whether this is the consequence of two distinct illnesses occurring coincidentally or due to a clinician error is unknown. A “glaucoma susceptibility gene” or an underlying abnormality in aqueous humor dynamics could potentially contribute to the predisposition of PEX eyes to develop glaucoma.¹²⁻¹⁴

We found bilateral glaucoma to be less prevalent than unilateral glaucoma in our analysis. Consequently, the most prevalent etiology of unilateral secondary open-angle glaucoma is pseudoexfoliation. In 26% of the study participants, the cup-disc ratio was found to be >0.6. Pseudoexfoliation consequently induces greater optic nerve injury than POAG. In some studies, bilateral pseudoexfoliation is more prevalent than unilateral pseudoexfoliation due to the fact that patients with unilateral pseudoexfoliation may progress to bilateral as the condition worsens with age and duration. Depending on the clinical profile and optical coherence tomography attributes, the prevalence may differ.

Thirty-six patients in our study had IOP readings below 20 mmHg, fifteen patients had IOP readings between 21 and 30 mmHg, and nine patients had IOP readings above 30 mmHg. Rao¹⁵ conducted a cross-sectional study on 91 subjects and found that the mean IOP for patients undergoing unilateral pseudoexfoliation was 18 ± 3.4 , whereas it was 20 ± 1.2 in cases involving bilateral pseudoexfoliation. Thomas et al.,¹⁶ conducted a cross-sectional study in which the mean intraocular pressure in the southern population of India was 24.141.4 mmHg with a standard deviation of 1.4 mmHg. Intraocular pressure elevation is correlated with the existence of pseudoexfoliation.

Limitations of the study

Limitations of the study were the inability to generalize the results to the entire population and the insufficient sample size.

Pseudoexfoliation becomes more prevalent as visual activity declines. Vision impairment and injury to the optic nerve can result from elevated intraocular pressure and an inadequate medication response. Eventually, it may result in impaired vision. Considering the patients' low socioeconomic status, lack of adherence, and average response to medical treatment, surgical intervention stands as one of the most effective treatment modalities for pseudoexfoliation glaucoma.

CONCLUSION

In conclusion, pseudoexfoliation was discovered to be increasingly common as people age, and it is often unilateral when it first shows but progressively develops into bilateral pseudoexfoliation, necessitating frequent follow-up in unilateral cases. Pseudoexfoliation is associated with an increased risk of glaucoma, and the majority of cases have open angles. In terms of glaucoma, bilateral pseudoexfoliation is more common than unilateral pseudoexfoliation. Unilateral glaucoma is more common than bilateral glaucoma.

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BP- Concept and design of the study, prepared first draft of manuscript; **MP-** Interpreted the results; reviewed the literature and manuscript preparation.

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