Section: Opthalmology

Original Research Article

# A CLINICAL STUDY ON PSEUDOEXFOLIATION SYNDROME AND GLAUCOMA IN PSEUDO EXFOLIATION SYNDROME

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ABSTRACT

**Background:** Glaucoma is the leading cause of irreversible blindness. Pseudo exfoliation is a recognised risk factor for developing glaucoma. Pseudo exfoliation glaucoma is the most common form of secondary open angle glaucoma. **Aim:** To study the demographics and clinical profile of pseudoexfoliation syndrome and occurrence of glaucoma in pseudoexfoliation. **Material and Methods:** The present study was conducted in a teaching hospital. 79 eyes of 50 patients with pseudoexfoliation syndrome attending ophthalmology outpatient department were included in the study. The patients with pseudoexfoliation were diagnosed by detailed anterior segment examination with slit lamp biomicroscope.Patients with exfoliative material at the pupillary border / lens capsule are examined for raised intraocular pressure by applanation tonometer. Gonioscopy bygoldmann4 mirrorgonio lens using slit lamp biomicroscope, fundus examination with direct ophthalmoscopy /slit lamp biomicroscope using 90D lens / indirect ophthalmoscopy, visual fields were done to diagnose pseudoexfoliation glaucoma.
**Results:** Pseudoexfoliation is commonly seen in patients >70 years age (44%).21(42%) patients had unilateral presentation, 29(58%) patients had bilateral presentation.77(97.47%) eyes had pseudoexfoliative material at pupillary border. Pseudoexfoliative material on anterior lens capsule was present in 69(87.34%) eyes. 52(65.82%) eyes had pseudoexfoliative material in angle of anterior chamber.24(30.38%) eyes had pseudoexfoliation glaucoma diagnosed by intraocularpressure >21mm Hg associated with glaucomatous disc changes and abnormal visual fields. 45 (56.96%) eyes with pseudoexfoliation are associated with nuclear cataract.
**Conclusion:** Psuedoexfoliation is commonly seen in elderly age group >70years.Glaucoma in Pseudo exfoliation syndrome is relatively common and has a more severe clinical course. Hence careful ocular examination of Pseudo exfoliation patients is mandatory to identify and treat glaucoma at the earliest.
**Key Words:** Glaucoma, Pseudoexfoliation (PXF), Intraocular pressure, Fundus Examination, Nuclear cataract.

## INTRODUCTION

Glaucoma is one of the leading causes of irreversible blindness worldwide. Pseudoexfoliation is one of the common causes of secondary open-angle glaucoma worldwide. It is noted to be a more aggressive disease with a mean progression rate higher than primary open-angle glaucoma. Pseudoexfoliation syndrome is a systemic microfibrillopathy, which targets ocular tissues through gradual deposition of proteinaceous material.[1] This fibrillar material is produced by cells in the anterior segment in response to oxidative stress.[2] Despite extensive research, the exact chemical nature of the fibrillar material is unknown. It is believed to be secreted multifocally in the iris pigment epithelium, the ciliary epithelium and peripheral anterior lens epithelium. The material moves into the aqueous humor and is carried to the

trabecular meshwork, following the normal flow. Obstruction of trabecular meshwork by this fibrillar material and pigment causes elevation of intraocular pressure leading to glaucoma.[1,2]

Thus, considering the clinical importance of pseudoexfoliation, a study has been carried out in this institution taking into account various aspects of this condition.

## MATERIALS AND METHODS

This is a hospital based prospective studyconducted over a period of 1year in a teaching hospital. Patients attending Ophthalmology outpatient department with pseudoexfoliation in one or both eyes were selected and enrolled in study. These patients were subjected to complete ocular examination.

**Inclusion Criteria**

All patients with pseudoexfoliation attending to ophthalmology outpatient department are included in the study.

**Exclusion Criteria**

Patients of pseudoexfoliation

1. With previous history of primary open angle glaucoma, angle closure glaucoma and other secondary glaucoma
2. With history of previous surgeries
3. With history of trauma
4. On topical steroids

Each case was evaluated by taking detailed history and complete ocular examination after informed consent. Relevant details in ocular and drug history were obtained from each patient including history of ocular trauma, ocular surgeries, previous ocular problems, usage of steroids.

Ophthalmic examination include Best corrected visual acuity, Slit lamp examination, Applanation tonometry, Gonioscopy, Visual fields. The patients were then dilated and slit lamp examination of lens and fundus was carried out. Pseudoexfoliation syndrome was diagnosed when exfoliative material is seen in any one of the anterior segment structures. Patients were diagnosed with pseudoexfoliation glaucoma when the intraocular pressure is >21mm Hg associated with glaucomatous disc changes and abnormal visual fields. They were prescribed anti glaucoma medications and followed up accordingly.

**Statistical Analysis**: Data was collected and analyzed by using Statistical Package for Social Sciences (SSPS), Version 19.

## RESULTS

Total number of patients included in the study was 50.

Total number of eyes included in the study was 79.

Following were the observations made in our study.

Out of 50 patients, 12 (24%) were between the age group 51-60 years, 16 (32%) between the age group 61-70 years, 22 (44%) were between the age group >70 years. Maximum number of patients 22 (44%) were between the age group >70 years. The mean age was 68.04 years +/- 1SD (SD = 7.85). [Table 1]

Out of 50 patients, 28 (56%) were males and 22(44%) were females. Male : Female ratio is 1.27:1. [Table 2]

Out of 50 patients 21 (42%) were having unilateral pseudoexfoliation, 29 patients (58%) were having bilateral pseudoexfoliation. [Table 3]

Out of 79 eyes, pseudoexfoliation material is most commonly seen at pupillary margin (97.47%), followed by anterior lens capsule (87.34%) and angle of anterior chamber (65.82). [Table 4]

Out of 79 eyes, raised intra ocular pressure is seen in 24 eyes i.e., (30.38%). [Table 5]

Out of 79 eyes, glaucomatous disc changes are seen in 24 eyes accounting for 30.38%. [Table 6]

Out of 79 eyes, 55 eyes (69.62%) showed normal visual fields. 24 eyes (30.38%) showed abnormal visual fields. [Table 7]

Out of 79 eyes with pseudoexfoliation, 24 eyes (30.38%) had pseudoexfoliative glaucoma, 55 eyes (69.62%) had no glaucoma. [Table 8]

Out of 79 eyes, 45 (56.96%) had nuclear cataract, 27 (34.18%) had senile immature cataract, 7 (8.86%) had senile mature cataract. [Table 9]

**CASE 1: RE PXF**

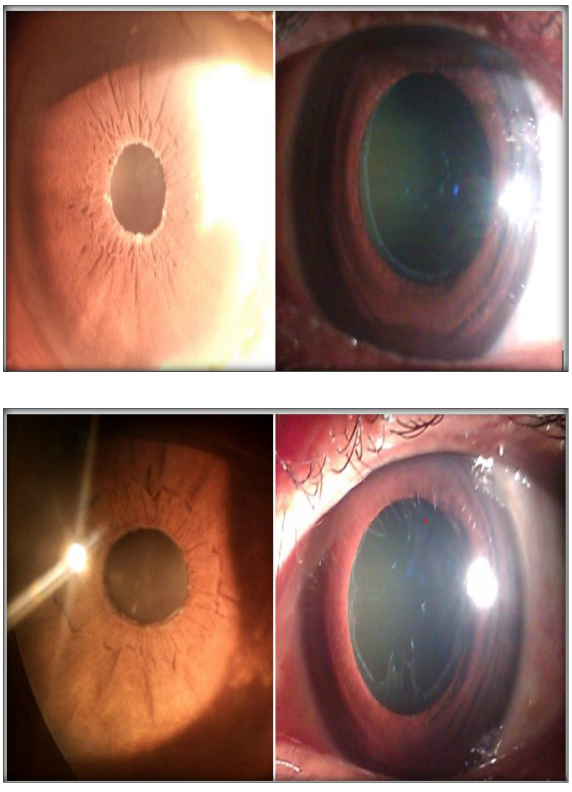

**Table 1: Age Distribution in Pseudoexfoliation: (N=50)**

| AGE (years) | NO. OF PATIENTS (N) | PERCENTAGE (%) |
|---|---|---|
| 51-60 | 12 | 24 |
| 61-70 | 16 | 32 |
| >70 | 22 | 44 |
| **TOTAL** | **50** | **100** |

**Table 2: Gender distribution in pseudoexfoliation: (n=50)**

| SEX | NO. OF PATIENTS (N) | PERCENTAGE (%) |
|---|---|---|
| MALE | 28 | 56 |
| FEMALE | 22 | 44 |
| TOTAL | 50 | 100 |

**Table 3: Laterality distribution in pseudoexfoliation: (n=50)**

| LATERALITY | NO. OF PATIENTS (N) | PERCENTAGE (%) |
|---|---|---|
| UNILATERAL | 21 | 42 |
| BILATERAL | 29 | 58 |
| TOTAL | 50 | 100 |

**Table 4: Distribution of pseudoexfoliative material (n=79)**

| | NO. OF EYES (N) | PERCENTAGE (%) |
|---|---|---|
| PSEUDO EXFOLIATIVE MATERIAL AT PUPILLARY MARGINS | 77 | 97.47 |
| PSEUDO EXFOLIATIVE MATERIAL ON ANTERIOR LENS CAPSULE | 69 | 87.34 |
| PSEUDO EXFOLIATIVE MATERIAL IN ANGLE | 52 | 65.82 |

**Table 5: Intraocular pressure changes in pseudoexfoliation (n=79)**

| INTRAOCULAR PRESSURE | NO. OF EYES(N) | PERCENTAGE (%) |
|---|---|---|
| <21mm Hg | 55 | 69.62 |
| >21mm Hg | 24 | 30.38 |
| TOTAL | 79 | 100 |

**Table 6: Optic disc changes in pseudoexfoliation: (n=79)**

| FUNDUS | NO. OF EYES (N) | PERCENTAGE (%) |
|---|---|---|
| NORMAL FUNDUS | 55 | 69.62 |
| GLAUCOMATOUS DISC CHANGES | 24 | 30.38 |
| TOTAL | 79 | 100 |

**Table 7: Visual field changes in pseudoexfoliation (n=79)**

| VISUAL FIELDS | NO. OF EYES (N) | PERCENTAGE (%) |
|---|---|---|
| NORMAL | 55 | 69.62 |
| ABNORMAL | 24 | 30.38 |
| TOTAL | 79 | 100 |

**Table 8: Glaucoma in pseudoexfoliation: (n=79)**

| PSEUDOEXFOLIATION | NO. OF EYES (N) | PERCENTAGE (%) |
|---|---|---|
| WITH GLAUCOMA | 24 | 30.38 |
| WITHOUT GLAUCOMA | 55 | 69.62 |
| TOTAL | 79 | 100 |

**Table 9: Type of cataract in pseudoexfoliation (n=79)**

| TYPE OF CATARACT | NO. OF EYES(N) | PERCENTAGE (%) |
|---|---|---|
| NUCLEAR CATARACT | 45 | 56.96 |
| IMMATURE CATARACT | 27 | 34.18 |
| MATURE CATARACT | 7 | 8.86 |
| TOTAL | 79 | 100 |

## DISCUSSION

This is a hospital based study conducted on 50 patients (79 eyes) with pseudoexfoliation.

**AGE INCIDENCE OF PSEUDOEXFOLIATION OF LENS**

Pseudoexfoliation of lensoccurs less commonly below 50 years of age. The study literature shows the highest incidence of the condition to occur between 60 -80 years, average being around 70 years.

Arvind H et al,2003,[3] Shazly et al, 2011,[4] S learner et al, 2007,[5] reported that the mean age of subjects with pseudoexfoliation was 64.7 ,68.15 and 72.94 years respectively. The odds of having PXF increase with increasing age and the prevalence of PXF has also been noted to rise with age.[6,7] The increase has been shown to be multifold, with odds

increasing up to 5–6 times by the age of 70–80 years as compared to the age of 40 years.[8,9,10] In the present study, the mean age of pseudoexfoliation was 68.04 years. 24% belong to age group of 51-60 years, 32% belong to age group 61-70 years, 44% belong to age group of > 70 years, which is comparable with previous studies. This indicates that pseudoexfoliation is a disease of old age with highest incidence between 61-80 years.

**GENDER DISTRIBUTION OF PSEUDOEXFOLIATION**

Though pseudoexfoliation is generally found to occur some years earlier in males than females there is no appreciable sex preference. Some studies show male predominance, some show female predominance and some studies show no statistically significant sex predilection. In the present study, out of 50 patients 28 (56%) were males and 22 patients (44%) were females, with Male: Female ratio of 1.27:1, which showed no statistically significant sex predilection. Male predominance in studies byRashad Qamar Rao, et al, 2006,[11] can be attributed to racial difference.

**LATERALITY DISTRIBUTION OF PSEUDOEXFOLIATION**

Most workers have found bilateral incidence of pseudoexfoliation to be more. In the present study, out of 50 patients, 21 patients (42%) had unilateral pseudoexfoliation, 29 patients (58%) had bilateral pseudoexfoliation, which is comparable with other studies.[4,11,14] This suggested that unilateral PXF is in fact a bilateral but asymmetric condition. Percentage of unilateral disease decreased with a corresponding increase in bilateral disease with increasing age.

**DISTRIBUTION OF PSEUDOEXFOLIATION MATERIAL**

The present study showed presence of pseudoexfoliative material at pupillary margins in 77 eyes (97.47%) similar to Warjri G, et al, (81.01%)13indicating that it is the common site where exfoliative material gets deposited due to rubbing of exfoliated material from anterior surface of lens capsule due to pupillary movement. The pseudoexfoliation material on anterior lens capsule is initially continuous and movement of iris rubs off the material immediately under its border, resulting in formation of lacunae between the central and peripheral zones.

Exfoliative material is seen on anterior lens capsule in 98.3% by. Rashad Qamar Rao, et al, 2006.[11] Our study reported presence of pseudoexfoliative material on lens capsule in 87.34% i.e., 69 eyes.

Pseudoexfoliative material is found in angle of anterior chamber in 56.7% eyes according to Rashad Qamar Rao, 2006.[11] The present study shows flakes of pseudoexfoliative material in the angle of anterior chamber in 65.82% i.e., 52 eyes which is comparable.

**GLAUCOMA IN PSEUDOEXFOLIATION SYNDROME**

A significantly higher prevalence of ocular hypertension and glaucoma is observed in PXF eyes when compared with normal eyes. PXF glaucoma is the most common form of secondary open angle glaucoma. In our study, on gonioscopy Grade 3-4 angle (according to Shaffers grading) is seen in 75 eyes (94.94%) with pseudoexfoliation glaucoma showing that PXF glaucoma is mostly secondary open angle glaucoma.

In the present study pseudoexfoliation glaucoma was found in 24 eyes (30.38%) with pseudoexfoliation, which is comparable with the other studies, Manickavelu.B.M,et al,(36%)12, Warjri.GB.et al, (23.07%)13, Archana L,et al, (52%).14

Percentage of PXF glaucoma is high in our study than H Arvind et al (13%)3, which is a population based study. The variation can be attributed to the difference in study design i.e., H Arvind et al 3 is a population based study where as the present study is a hospital based study. In the present study nuclear cataract is seen in 56.96% of patients with pseudoexfoliation, which is comparable with Archana L et al, where nuclear cataract is seen in 65% of cases.[14]

## CONCLUSION

Pseudoexfoliation and glaucoma are public health problems in older age worldwide. In recent years, the expansion in knowledge of the epidemiology, pathogenesis, and genetics of Pseudoexfoliation and glaucoma has provided important insights for understanding this disease. From this study we infer that all patients with pseudoexfoliation should be evaluated for glaucoma. In pseudoexfoliation syndrome, about 1/3rd cases develop secondary open angle glaucoma during their clinical course. Being it amore aggressive disease with a mean progression rate higher than primary open-angle glaucoma it is important to diagnose and treat this condition at the earliest.

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