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Slit Lamp profile of Pseudoexfoliation eyes

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ABSTRACT

Background: Pseudoexfoliation syndrome is an age-related systemic microfibrillopathy, caused by progressive accumulation and gradual deposition of extracellular grey and white material over various tissues. It is associated with many intraocular abnormalities like poor pupillary dilatation, zonular dehiscence, glaucoma etc. Hence it is important to do detailed slit lamp examination with dilated pupil to detect the pseudoexfoliative deposits in eye, especially in elderly to prevent unforeseen complications. **Aims and Objective:** To study pattern of distribution of pseudoexfoliative material in eyes with pseudoexfoliation syndrome and to study the dilatation profile of pupil in such eyes. **Materials and Methods:** This observational study was conducted on patients with pseudoexfoliation syndrome who attended OPD in the Upgraded Department of Ophthalmology, Government Medical College, Jammu from 1st April 2018 for a period of 6 months. The clearance was taken from ethical committee for the study in reference. Informed consent was taken from all the patients enrolled in the study. **Results:** Pupillary margin was found to be the most common site for deposition of pex material i.e. 51 (75%) patients followed by anterior surface of lens in 32(47.05%) patients. Patients had simultaneous deposition of pex material over various parts of the eye. 64 (94.12%) patients had pex material deposited on pupil or lens. Only 1(1.47%) patient had pex deposits over cornea. 56 (82.35%) patients attained good to moderate dilatation of pupil with 0.8% tropicamide e/d. 12(17.65%) patients had pupillary dilatation of ≤4mm hence poor dilatation. **Conclusion:** Pseudoexfoliation presents challenges that must be adequately addressed with detailed slit lamp examination. Cases may go undetected due to failure to dilate the pupil or to examine with slit lamp after dilatation. Adequate pre-operative assessment should especially be done before cataract surgery with the aim to identify problems like the possibility of fragile zonules and inadequate mydriasis which could increase intraoperative complications arising from undue manipulations.

Key words: Pseudoexfoliation; pupillary dilatation; slit lamp

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INTRODUCTION

The term pseudoexfoliation is derived from two words *pseudo (greek - pseudes)* meaning false and e*xfoliate* (latin - *exfoliare)* means to strip off leaves, therefore a condition in which the cells or the exfoliative material is not actually detached. Pseudoexfoliation syndrome is an age-related systemic microfibrillopathy, caused by progressive accumulation and gradual deposition of extracellular grey and white material over various tissues (Ritch R, Schlotzer-Schrehardt U 2001).[1] Tarkkanen (1962) found that the prevalence of pseudoexfoliation syndrome varies enormously in different parts of world. Prevalence varies from 0 to 40% worldwide as follows: China-0.4% (Young AL, Tang WW, Lam DS, 2004),[2] Pakistan-6.45% (Rao RQ, Arian TM, Ahad MA, 2006),[3] India-7.4% (Lamba and Giridhar),[4] Turkey-16.7% (Sekeroglu MA et al., 2008),[5] South Africa-26% (Bartholomew RS, 1973),[6] Ethiopia-39.3% (Teshome T, Regassa K, 2004).[7] Pseudoexfoliation syndrome occurs between 60-80 years of age. It is a bilateral disease with clinically marked asymmetrical presentation (Hammer 2001).[8] Prevalence of pseudoexfoliation increases with the age of general population. Pseudoexfoliation syndrome is associated with many intraocular abnormalities like corneal endothelial cell abnormalities, shallow anterior chamber, mild aqueous flare due to impaired blood aqueous barrier,

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iris transillumination defects, poor pupillary dilatation, trabecular hyperpigmentation, white flaky deposits on anterior lens capsule, cataract, phacodonesis, raised intraocular pressure, glaucoma. Repo LP et al., (1996)[9] found degenerative changes in both the stromal tissue and in the muscular layer of iris and regarded this as one of the causes for miosis. Many cases may go undetected due to failure to dilate the pupil or examine the lens surface with the slit lamp.

MATERIALS AND METHODS

The study was conducted on 68 patients with pseudoexfoliation syndrome who attended OPD in the Upgraded Department of Ophthalmology, Government Medical College, Jammu from 1st April 2018 for a period of 6 months. The clearance was taken from ethical committee for the study in reference. Informed consent was taken from all the patients enrolled in the study.All patients were evaluated for visual acuity – snellens chart, with and without pinhole refraction, extra-ocular examination, tonometry – Non contact tonometer / Schiotz tonometer,Fundoscopy – direct ophthalmoscopy / indirect ophthalmoscopy / slit lamp biomicroscopy with 90/78 D lens,Lacrimal sac test – sac syringing test, Slit lamp and Gonioscopy to detect pseudoexfoliation material in the pupil and lens, moth eaten appearance of the iris, corneal alterations, chamber depth and pigment dispersion, iridodonesis, posterior synechae, extent of trabecular pigmentation, presence of pseudoexfoliation material in the angle, presence of Sampolesi's line, angle width, examination of lens for the type of cataract, phacodonesis, frank sublaxation or dislocation of lens. Pre and post dilatation size of pupil was recorded. Pupil was dilated with mydriatic eye drops (tropicamide 0.8% and phenylephrine 2.5%). Pupillary diameter after dilatation was graded as

1. Poor (2-4 mm),
2. Moderate (5-6 mm) and
3. Good (7-9 mm or more).

Data was analyzed though statistical package for social sciences version 22.0.

RESULTS

Out of the total of 68 patients with pseudoexfoliation who were enrolled in the study, 22 (32.35%) patients had unilateral PEX while 44(67.64%) had bilateral PEX. 51.47% patients had pseudoexfoliation in the right eye. A difference of 2.94% was observed among the two eyes, but it doesn't carry any statistical significance (Table 1).

Thirteen percentage of patients had visual acuity 6/6-6/12 and 28% had acuity of 6/18-6/36. 40(56%) patients had visual acuity ≤6/60 in the eye and 2 patients were one eyed (Table 2).

Pupillary margin (Image 1) was found to be the most common site for deposition of pex material i.e. 51 (75%) patients followed by anterior surface of lens (Image 2) in 32(47.05%) patients. Patients had simultaneous deposition of pex material over various parts of the eye. 64 (94.12%) patients had pex material deposited on pupil or lens. Only 1(1.47%) patient had pex deposits over cornea (Table 3).

Fifty-six (82.35%) patients attained good to moderate dilatation of pupil with 0.8% tropicamide e/d. 19 (27.94%) patients were able to achieve full pupillary dilatation. 49 (72.06%) patients had ≤ 7mm dilatation of pupil (Image 3).

Table 1: Laterality of eye

Eye	Number of patients	Percentage (%)
Right	35	51.47
Left	33	48.53
Total	68	100

Table 2: Best corrected visual acuity recorded from the patients was as follows

Visual acuity	Number of patients	Percentage (%)
6/6 - 6/12	9	13.23
6/18-6/36	19	27.95
≤ 6/60	38	55.88
No PL	2	2.94
Total	68	100

Table 3: Distribution of pseudoexfoliative material on various parts of eye

Parts of eye having PEX deposits	No. of Patients	Percentage (%)
Pupil	51	75
Iris	23	33.82
Lens	32	47.05
Cornea	1	1.47
Angle	4	5.88
Other	0	0

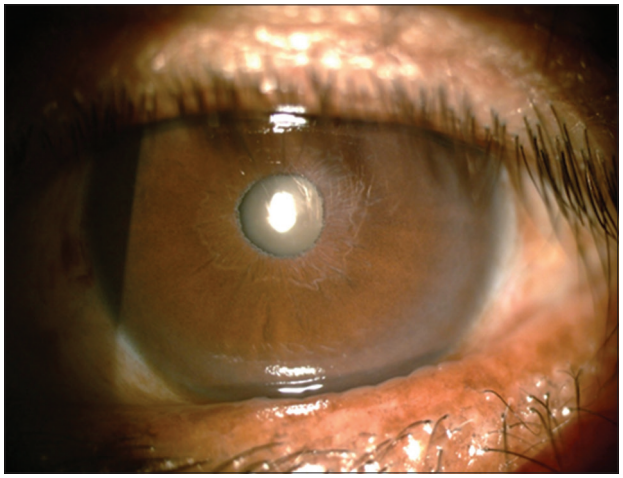

Image 1: Slit lamp photograph of pseudoexfoliation deposits over pupillary margin and anterior surface of iris

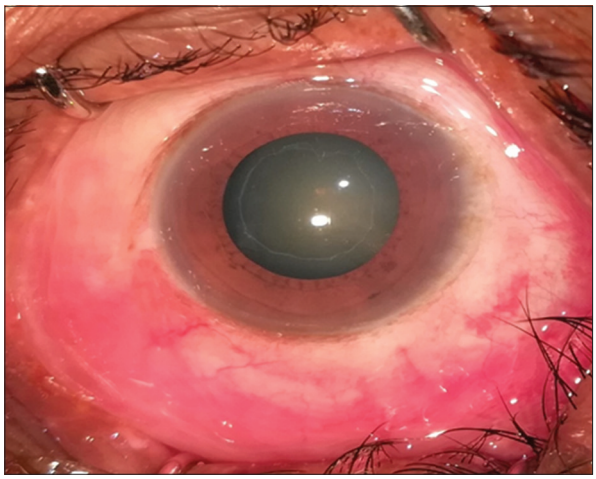

Image 2: Pseudoexfoliation ring over anterior lens surface (viewed in a dilated pupil)

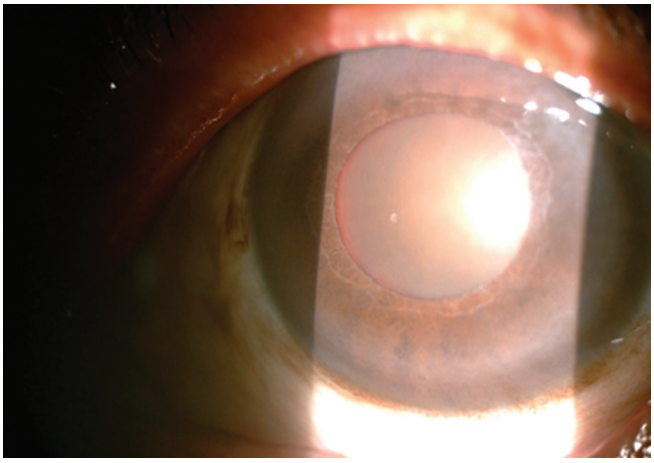

Image 3: Slit lamp photograph moderately dilated pupil with whitish pseudoexfoliation deposits

12(17.65%) patients had pupillary dilatation of ≤4mm hence poor dilatation (Table 4).

DISCUSSION

In our study, 22 (32.35%) patients had unilateral PEX while 44(67.64%) had bilateral PEX. Our findings are consistent with the studies below (Table 5).

Highest number of patients 51(75%) had deposition of pseudoexfoliative material at the pupillary margin followed by 32(47.05%) had deposits over anterior lens capsule. 4(5.88%) patients had deposits in angle while 1(1.47%) patient had deposits over cornea. Changes in iris were: 11(16.17%) atrophy, 6(8.82%) moth eaten, 3(4.41%) patients had floppy iris and 2(2.94%) iridodonesis. Similar findings were seen in Sandeep K, Vekkatram (2017)[12] study where 74% had PEX material on the pupil margin, 60% had deposits over lens capsule, 40% on the iris surface.

Table 4: Pupillary dilatation of the eye

Pupillary dilatation	Number of patients	Percentage (%)
Good (≥7mm)	19	27.94
Moderate (5-6mm)	37	54.41
Poor (2-4mm)	12	17.65
Total	68	100

Table 5: Comparison of laterality of pseudoexfoliation in different studies

Laterality	Our study	Choudhary KG study[10]	Sinha A study[11]	Sandeep K study[12]
Bilateral	67.64%	66%	62%	62%
Unilateral	32.35%	34%	38%	38%
Total	100%	100%	100%	100%

Anuradha A et al., (2015)[13] demonstrated that 80% of patients had pseudoexfoliative material on the pupillary margin, 40% on the iris surface, 10% had iris atrophy and 0.33% had iridodonesis. Sinha AS et al., (2017)[11] found iridodonesis to be 2% in their study. All these findings are similar to what we observed while doing this dissertation.

Fifty six (82.35%) patients attained good to moderate dilatation of pupil with 0.8% tropicamide e/d. 19 (27.94%) patients were able to achieve full pupillary dilatation. 49 (72.06%) patients had ≤ 7mm dilatation of pupil. 12(17.65%) patients had pupillary dilatation of ≤4 mm hence poor dilatation. In work done by Choudhary KG et al., (2017),[10] 34(78%) patients showed good to moderate pupillary dilatation out of 50. In a study by Islam MN et al., (2017)[14] 65.32% eyes showed <7mm pupillary dilatation. Our study is in confirmation with the results of above studies.

CONCLUSION

Inadequate mydriasis is one of the major finding in eyes with pex. Adequate surgical modifications such as sphincterotomy and/or synechiolysis in these eyes with inadequate mydriasis are required when cataract surgery is undertaken in such eyes. All though cataract surgery in pseudoexfoliation syndrome is challenging, if the surgeon is aware of the condition pre operatively and pays meticulous attention to the surgical technique, a good outcome can be expected. Also, up to 50% of pseudoexfoliation patients have associated glaucoma. Hence, it is important to carefully examine eyes and detect pseudoexfoliation syndrome to reduce ocular morbidity and mortality.

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Author's Contribution:
SK - Concept and design of study and prepared first draft of manuscript; **AK -** Compiling the results, reviewed the literature and did statistical analysis; **DG -** Supervision, preparation and review of manuscript.

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