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To Study the Iris Characteristics in Patients with Pseudo-Exfoliation Syndrome

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Abstract

Introduction: Pseudoexfoliation syndrome is an age related disease characterized by production of extracellular material in the anterior segment of the eye and other tissue of the body. It is the most common cause of secondary open angle glaucoma in the world. Cataract occurs with increased frequency in eyes with pseudo-exfoliation and surgery is potentially complicated by the presence of small pupil and weak zonules.

Aims and objectives : The present study is done to study the iris characteristics and pupil dilatation in patients with Pseudo-exfoliation syndrome.

Materials and methods: The materials from the present study in drawn from fifty eyes of fifty patients of pseudoexfoliation syndrome in the department of ophthalmology at Sri Siddhartha Medical College and research Institute, Tumkur during the period November 2016 to October 2018.

A careful and detailed history was taken regarding the duration and symptom of the disease. Slit lamp biomicroscopy examination for the evidence exfoliative material at the pupillary margin, and . Pupil reaction, size and shape were noted before and after mydriatics.

Results: The average age of the patients in this study was 63.72±9.49 years with male and unilateral predominance. In this study 72% of the patients had presence of exfoliative material on the pupillary margin, 18% had moth eaten appearance, 36% had iris atrophy, 10 % had posterior synechiae and none of the patients had iridodonesis.

In this study 44% of the patients had 3mm, 30% had 2mm and 26% had 4mm of pre-operative pupil dilatation size.

Conclusions: Insufficient mydriasis is one of the major risk factor in eyes with pseudoexfoliation syndrome which will have effects on cataract surgery. Detailed pre-Operative assessment of the anterior segment examination to diagnose pseudoexfoliation syndrome can lead to improved tailoring of the patients undergoing cataract surgery.

Keywords: Pseudoexfoliation syndrome, insufficient mydriasis

MeSH Terms: Exfoliative material, iridodonesis, moth eaten appearance, posterior synechiae and iris atrophy

Introduction

Pseudoexfoliation syndrome is a widespread degenerative disease occurring especially in older people where in a grey white fibro-granular material accumulates not only upon and within the lens capsule but also on iris, ciliary body, around the vessels of uvea and in various other organs.

Awareness and interest in this disease comes from spectrum of intraocular risk not only for open angle glaucoma but also in conjunction with intraocular surgery especially with cataract extraction.

Exfoliation is more common with age. It is rare before the age of 50 but becomes increasingly common thereafter, nearly doubling in incidence every decade. Pseudo-exfoliation syndrome often occurs unilaterally, reports indicate that 48 to 76% of cases appear to be unilateral at time of diagnosis. In addition studies indicated that 13.43% of patients with unilateral exfoliation will acquire it in the fellow eye after 5-10 years.

In the eye, exfoliation syndrome is characterized clinically by small white deposits of material in the anterior segment, most commonly in the pupillary border and the lens capsule.

The clinical signs that help in early diagnosis are loss of pigment from peripupillary area producing transillumination defects, insufficient mydriasis, and pigment dispersion into anterior chamber after mydriasis, melanin deposits over trabecular meshwork and Schwalbe's line. The existence of posterior synechiae without any other cause and hemorrhage in iris stroma after mydriasis are also suggestive of exfoliation syndrome. Deposition of material on zonular fibers weakens it leading to phacodonosis, subluxation, and dislocation of lens. Exfoliative glaucoma has more serious clinical course and worse prognosis than chronic open angle glaucoma, often not responding to medial therapy and requiring early surgical intervention. Angle closure glaucoma may also be seen due to pupillary block by forward displaced lens. The corneal endothelium shows decreased cell count and pleomorphism leading to early corneal decompensation and a moderate rises in intraocular pressure after cataract surgery. An increased incidence of nuclear cataract is seen in association with this syndrome.

Diagnosing requires a careful slit lamp examination after pupillary dilatation. Due to involvement of virtually all structures by the exfoliative material, patients have significantly greater risk for a variety of complications during cataract surgery. Poor mydriasis, pigment dispersion, phacodonosis and zonular dialysis predispose to capsular rupture and vitreous loss. There is breakdown of blood aqueous barrier leading to transient elevation of intraocular pressure and uveitis after surgery. Late complications include posterior capsule opacification, capsular phimosis, and decentration of intraocular lens and decompensation of corneal endothelium.

Materials and Methods

The present study titled "To study the Iris characteristics in patients with Pseudo-exfoliation syndrome" was carried out in the department of Ophthalmology in Sri Siddhartha Medical College & Research Centre, Agalkote, Tumkur.

Source of data: The study group includes all patients with Pseudo-exfoliation syndrome visiting the OPD and IPD of the department of Ophthalmology of Sri Siddhartha Medical College hospital, Tumkur.

Study design: Cross sectional study

Inclusion criteria: Patients with pseudoexfoliation syndrome as Reverend by pseudoexfoliative material on the corneal endothelium, ciliary body and pupillary margins

Exclusion criteria

- Previous ocular trauma
- Complications like subluxation or dislocation of the cataractous lens
- Lens induced Glaucoma
- Previous intra ocular surgery
- YAG LASER

- Patients with secondary cataract, complicated cataract, anterior uveitis
- Patients with diabetes.

Sample size: The materials for the present study will be drawn from consecutive patients with pseudoexfoliation syndrome in department of ophthalmology at Sri Siddhartha Medical College and Research Institute , TUMKUR during the period 2016 – 2018 will be sourced for the study after obtaining the written informed consent.

Materials and Methods of collection of data: Pretested Proforma was prepared first. Collection of data was started once clearance was obtained from Ethical clearance committee of Sri Siddhartha Medical College, Tumkur, after taking informed consent from the patients.

After detailed history including previous treatment and optical correction, ocular

Examination was done with particular reference to the following:

- Assessment of vision including visual acuity and when necessary visual fields.
- In all patients refraction was done.
- Slit lamp examination of the anterior segment included detailed examination of the cornea, anterior chamber depth, iris, pupil and lens. Size of the pupil was noted in particular before dilatation with mydriatics to assess the adequate dilatation and anticipate difficulty intraoperatively.
    - Pattern of XF material deposited was surveyed and documented on pupil, iris, corneal endothelium, angle of anterior chamber, and anterior surface of the lens capsule.
    - Pupils dilated with tropicamide 0.5% eye drops and phenylephrine 5% eye drops. Ability of the pupil to dilate following dilatation of pupil noted after 30 min.
    - Pupil dilatation was considered not adequate when it dilated<5mm.

Data management and Analysis

Data was entered into Microsoft excel and was compared with data on the hard copy forms to ensure accuracy. Inconsistencies were detected by running simple frequencies and correlations and those identified were addressed before data analysis began.

Data was summarized using tables, pie charts and bar charts. Continuous data summarized using measures of central tendency . Analysis was done using SPSS version 23.0.

For Categorical variables based on distribution Pearson Chi-Square test was used to compare groups. In cross tabs bigger than 2 x 2, if more than 20% of the cells had an expected count less than 5 then likelihood ratio was taken into consideration. In 2 x 2 cross tabs if all 4 cells had an expected count of >10 than Pearson Chi-Square test was used and if any of the cells had an expected count of < 10 than Fisher's Exact test was used.

For continuous variables Student's t-test (Independent samples t-test) was used.

Independent samples Kruskal-Wallis test was used for non-parametric analysis.

Results

A study consisted of 50 eyes of pseudoexfoliation syndrome.

The majority of the patients were in the age group of 60-69 years. Mean age group was 63.72±9.49 years.

In the present study 64% of the males were affected compared to 36% females.

In this study 64% of the eyes had visual acuity worse than counting fingers 3MT and 36% had from counting fingers 4MT to 6/60.

Iris had following features in the affected eyes in our study, most prominent being white bordering of the pupil margin. In this study 72% of the patients had presence of exfoliative material on the pupillary margin, 18% had moth eaten appearance, 36% had iris atrophy, 10 % had posterior synechiae and none of the patients had iridodonesis.

Size of the pupil was noted in particular before and after dilatation with mydriatics to assess the adequate pupil dilatation and anticipate difficulty. Baseline diameter of pupils in the affected eye under study as follows . In this study 44% of the patients had 3mm, 30% had 2mm and 26% had 4mm of pre-operative pupil dilatation size. In the present study 66% had sufficient mydriasis and 34% of patients had insufficient mydriasis. Range was 2-4mm in the predilatation size and 3-8mm in the post dilatation size. The mean difference between pre and post dilatation pupil size is significant ($p<0.05$).

Discussion

This study consisted of fifty eyes of fifty patients with XFS with visually significant cataract who underwent cataract surgery in Sri Siddhartha Medical College and Research Institute, Tumkur.

Mean age of the patients were 63.72±9.49 years ranging from 45-90years. Majority of the patients were between ages of 60-69 years. Similar results were found in study done by Arvind et al (64.7±9.3 Yrs.). In a study done by Krishnadas et al mean age of patients was 63 with range of 46-85 years. Study done by abid Naseem. Et al showed a mean age of 68.8±7.57 yrs. . Previous reports of exfoliation have shown age related increase. XFS is typically less common below age of 60 years and increases thereafter.

In the present study 64% of the males were affected compared to 36% females. Studies regarding the sex distribution of XFS are conflicting. Women have predominated in some series while other studies have found equal or greater prevalence in men.

In the study done by Arvind et al, no significant prediction was found in either sex. Whereas in study done by Krishnadas et al 57.8% were men and study by abid Nazeem et al showed 67% more in males.

In the present study 60% of eyes have unilateral involvement and 40% had bilateral involvement. Study done by Arvind et al showed 49% had unilateral involvement. Whereas study by Krishnadas showed more of bilateral involvement (70.1%) and Abid Naseem et al study also showed bilateral involvement (76%).

In the present study 72% of eyes showed presence of exfoliation on the pupillary margin, 18% had moth eaten appearance, 36% had iris atrophy, 10% had posterior synechiae and none of them had iridodonesis.

In the study by Hammer T, et al showed deposits of exfoliation material on iris sphincter and pupillary margin are seen in 84% patient. Thus next to the lens, the most prominent and consistent clinical finding is exfoliation material at the pupillary border which is a suspicious sign to look during the preoperative evaluation.

In the present study 66% had sufficient mydriasis and 34% of patients had insufficient mydriasis following use of topical mydriatics. This is in concurrence with following studies. Freyler H, et al noted pupillary dilatation less than 4mm in 19 of 32 (59%) patients with XFS who underwent cataract surgery. Asano N, et al attributed poor mydriasis in XFS to Degenerative changes of sphincter and dilator muscle tissue and apparent involvement of the muscles cells in exfoliation material fiber formation. Alfaiate et al noticed insufficient mydriasis (p value<0.001) in their study of 183 patients with XFS. Reduction of stromal elasticity by

accumulation of exfoliation material may also play a role in poor mydriasis. Stanila A et al also noted an increased incidence of insufficient pupil dilation in 10 patients with XFS undergoing cataract surgery in their study. Avramides S et al in their study of 84 patient with XFS who underwent ECCE, noted that 61.90% of them had pupillary dilation less than 5mm.

There was predilatation pupil size 2.96±0.75 of ranging from2-4mm and mean of post dilatation pupil size 5.8±1.41 ranging from 3-8mm. Mean difference was 2.84 which is significant($p<0.05$)

Therefore it is noted that insufficient pupil dilatation is common in XFS, especially when exfoliative material is present in pupillary margin which leads to less dilatation of pupil and results in increased intraoperative complications.

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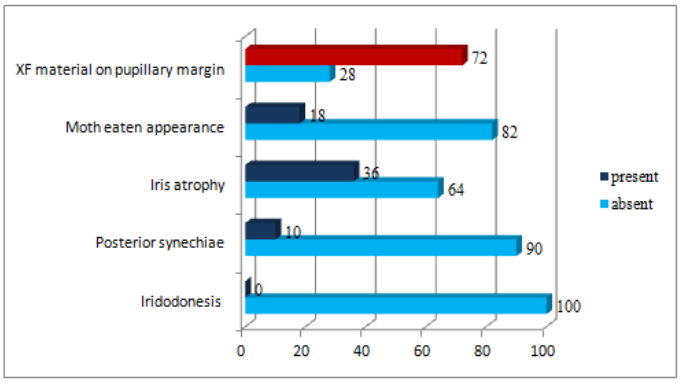
Tables and Figures

Table 1: Iris Features

Iris features	No. of eyes Present (%)	Absent (%)
XF material on pupillary margin	36 (72%)	14 (28%)
Moth eaten appearance	9 (18%)	41 (82%)
Iris atrophy	18 (36%)	32 (64%)
Posterior synechiae	5 (10%)	45 (90%)
Iridodonesis	0	50 (100)
Total	50	100.00%

Graph 1: Iris Features



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