Valley International Journals
Open Access Journal
New Thinking New Innovation

International Journal Of Medical Science And Clinical Inventions
Volume 2 issue 03 2015 page no. 766-771 ISSN: 2348-991X
Available Online At: http://valleyinternational.net/index.php/our-jou/ijmsci

Pseudoexfoliation Syndrome: Prevalence In South Indian Population

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ABSTRACT:

Pseudoexfoliation (PXF) is an age related, systemic, elastic fibrillopathy causes serious complications during cataract surgery such as zonular dialysis, capsular rupture and vitreous loss.

AIM-To study the prevalence, age and sex distribution, and laterality of involvement of pseudoexfoliation (PXF). To study the distribution of PXF material in the eye and its association with cataract .MATERIALS AND METHODS-This was an observational and cross sectional study conducted at Rajiv Gandhi Institute of Medical Sciences, Kadapa, Andhra Pradesh. All patients who presented to ophthalmology OPD during Jan 2014 to October 2014 were included. PXF was diagnosed on slit lamp examination by the presence of white dandruff like material in the pupillary margin or on the anterior lens capsule of one or both eyes. Intra ocular pressure was measured by Goldmann applanation tonometer. Gonioscopy was done to know the status of angles, pigmentation and presence of PXF material and direct ophthalmoscopy was done to observe the disc changes. RESULTS- Out of 9413 patients, 59 patients presented with PXF (0.6%). PXF was more common in males (36) as compared to females (23) and in the age group above 50years. 32 patients had unilateral presentation and 27 had bilateral presentation. PXF material was most commonly found on the pupillary margin and on the anterior lens capsule. PXF is commonly associated with nuclear cataract.11 patients had IOP more than 21 mm Hg and 6 patients had glaucomatous disc changes. CONCLUSIONS- The prevalence of patients with PXF was 0.6%. The association of PXF with blindness and aging has public health implications. Pseudoexfoliation thus is an important cause for ocular morbidity. Ophthalmologists should focus on the detection of pseudoexfoliation especially considering the risks for operative complications related to pseudoexfoliation and the higher prevalence of glaucoma among these patients. The diagnosis of PXF may also be important in the management of glaucoma in this population.

KEYWORDS: Pseudoexfoliation, Glaucoma, Cataract.

1. INTRODUCTION

Pseudoexfoliation **(**PXF) is an age related, systemic, elastic fibrillopathy first described by Finnish ophthalmologist John Lindberg in 1917. PXF syndrome occurs when several ocular tissues synthesize an abnormal

protein. This protein may obstruct the trabecular meshwork and cause glaucoma. PXF is built up as an elastic fibril system of complex glycoprotein structure. [1] It is produced by different intraocular cells including ciliary epithelium, vascular endothelial cells, and different cell types of the iris, trabecular endothelium, and lens epithelium. PXF is a major risk factor for developing glaucoma. PXF syndrome is the most common identifiable cause of open-angle glaucoma worldwide. It is a systemic disorder with important eye manifestations, including development of open- and closed-angle glaucoma and of cataract with zonular instability. [2] It may also be associated with increased systemic risk of cardiovascular disorders. The glaucomatous effect of PXF has been shown to be mediated through elevated IOP. [1] The accumulation of PXF material in the trabecular meshwork is probably the mechanism for increasing IOP.

The prevalence of exfoliation increases dramatically with age and varies considerably among populations worldwide.[3]The tremendous variation in prevalence of exfoliation syndrome is caused by true differences in the populations studied, but it may also vary because of other factors such as difference in age, environmental influences, definition of exfoliation syndrome, and examination techniques. PXF syndrome is more common in older age-groups, with most cases occurring in the late 60s and early 70s. The condition may be unilateral or bilateral, and over half of unilateral cases become bilateral over a 20-year period. [4]

Pseudoexfoliation causes serious complications during cataract surgery such as zonular dialysis, capsular rupture and vitreous loss. Glaucoma is the most important sequel of PXF syndrome. It is the most common identifiable cause of secondary open angle glaucoma caused due to PXF. [5] Pseudoexfoliation glaucoma is frequently more resistant to medical management compared to primary open angle glaucoma.

PXF is a known risk factor for developing cataracts. [6]Complicating factors such as poor mydriasis, zonular weakness, corneal endothelial dysfunction, higher rate of vitreous loss, capsular phimosis, and opacification have all been reported after cataract surgery. [7,8] PXF is considered to be a systemic disorder, pseudoexfoliative material has been reported in lungs, skin, liver, heart, kidney, gallbladder, blood vessels, extra ocular muscles and meninges. [9] An association between PXF and sensorineural deafness has been reported. [10, 11, 12]

The main aim of conducting this study was to assess the prevalance of pseudoexfoliation syndrome and its association with glaucoma and cataract.

2. MATERIALS AND METHODS

Study design

This was an observational and cross sectional study conducted at Rajiv Gandhi Institute of Medical Sciences, Kadapa, Andhra pradesh. All patients who presented to ophthalmology OPD during Jan 2014 to October 2014 were included. The study protocol was approved by institutional ethical committee. A total of 9413 patients were included in the study. Demographic details of all patients were noted. A detailed ocular and systemic history was noted.

Inclusion criteria:

- Both male and female patients above the age of 40years were included in the study.

Exclusion criteria:

- Patients with ocular infections, post operative cases, known cases of primary open angle glaucoma and Angle closure

glaucoma who were on medication were excluded.

Ocular examination:

A complete ocular examination was done. Visual acuity and Best corrected visual acuity was examined by snellen's chart. The pupils were dilated using tropicamide. After pupillary dilatation, the anterior segment was examined for the presence of PXF by detailed slit lamp assessment. PEX was identified as the presence of exfoliative deposits on the pupillary border and the anterior lens capsule with or presence of deposits elsewhere in the anterior segment. Detailed examination of lens was done to know the type of cataract.

Intraocular pressure: IOP was measured with Goldmann applanation tonometer in each eye.

Gonioscopy: Gonioscopy was done to know the status of angles whether open or closed and for the presence of PXF material in the angle of anterior chamber.

Optic disc evaluation: Careful assessment of optic disc changes were made by Direct ophthalmoscopy, Slit lamp biomicroscopy using a 90 D lens. Changes in the optic disc, cup disc ratio, retinal nerve fibre layer damage, thinning of the neuroretinal rim, shifting of the retinal vessels were all noted.

Statistical analysis:

The data was analysed using Microsoft excel and Statistical Package for the Social Sciences version 12. Chi square test was applied and p value less than 0.05was considered statistically significant.

2. OBSERVATIONS AND RESULTS

A total of 9413 patients were included in the study. Out of 9413 patients, 59 patients presented with psuedoexfoliation (0.6%). Out of 59 patients, 36 patients were males and 24 patients were females. Thus males constituted 61% of study population and females constituted the rest 40.6%.

	With PXF	Without PXF	Total
Males	36	5238	5274
Female	23	4116	4139
	59	9354	9413

Table.no-1: Sex wise distribution of PXF

The prevalence of pseudoexfoliation was significantly higher among the age group of 60-70 yrs which constituted 49% (n=29) and 30.5% (n=18) in age group of 50-60yrs.

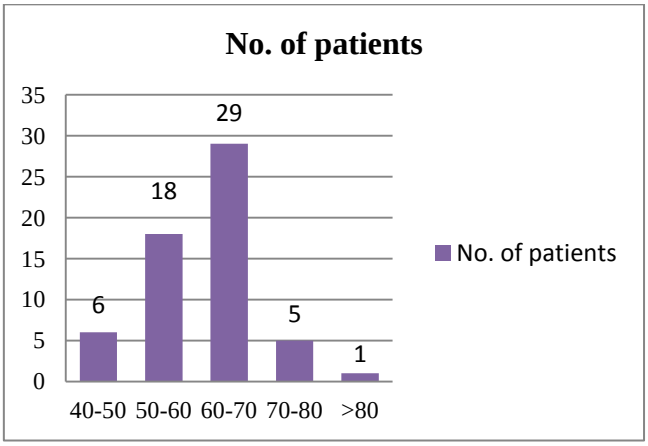

Fig. no -2: Age wise distribution of PXF

PXF was unilateral in 32 patients and bilateral in 27 patients. Thus in 54.2% patients the disease was unilateral and in 45.7% patients the disease was bilateral.

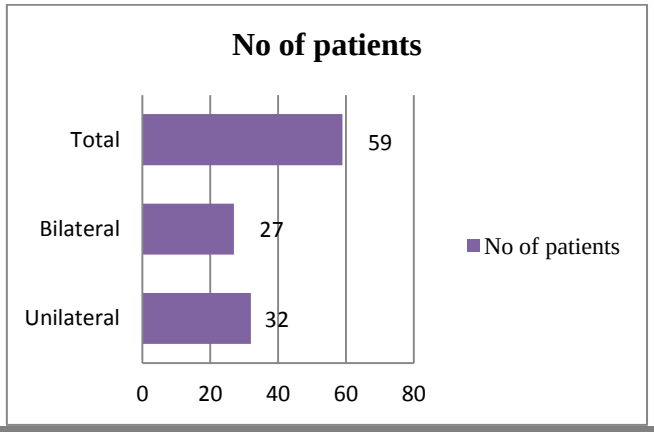

Fig. no -3: Laterality of involvement of PXF

Pseudoexfoliation material was found on the pupillary margin of iris in 13 patients and on anterior surface of lens in 20 patients. In 26 patients material was found on both the areas. In the present study no patients were found with pseudoexfoliation on the corneal endothelium.

Present study showed that 19 patients (32%) had an immature cataract, 36 patients (61%) had nuclear cataract and 4 patients (6%) had hypermature cataract.

In study 42 patients (71%) had IOP less than 20 mm Hg, 11 patients (18.6%) had IOP more than 21 mm Hg. 6 patients (10%) presented with glaucomatous disc changes in patients pseudoexfoliation.

4. DISCUSSION

Pseudoexfoliation (PXF) is an age-related disorder characterized by the accumulation of a fibrillar extracellular material in ocular tissues and is often associated with glaucoma.

Present study shows a male predominance (36) as compared to female (23 patients). These results agree to the observations of Shreya.M et al. [13] which showed a male preponderance of 70.3%. Clements and Luntz found higher incidence among males. [14][15] Contrary to this study, a similar study in Finland showed a higher incidence in females 16.2% and 14% in males. [16]

Present study showed an increase in the prevalence of PXF with age and this is in accordance with study done by Thomas et al and Arvind et al. [17, 18] The youngest patient in this study being 42 yrs old and the older one 80 yrs old.

In the present study the prevalence of PXF was more in the age group of 60-70 years accounting
for 49.1% (n=29) and 50-60years 30.5% (n=18). These results were similar to the findings observed in Rashad QR et al which showed a prevalence of 4.2% in the age group of 50-60yrs, 20.8% in the age group of 60-70 and 75% in age group above 70 yr. [19] These were also similar to the findings observed in Kouros et al study. [20]

In the present study, 54.3 % of patients showed unilateral involvement (n=32) while 45.7% had bilateral involvement (n=27). According to Thomas et al PXF was seen in only one eye in 34 patients (46.6%) and in both eyes in 39 (53.4%). [17] A similar study done by Shreya M et al showed 68 % unilateral involvement while 32 % had bilateral disease. [13] Unilateral PXF was noted in 17.8% of the PXF group and bilateral PXF was noted in 82.2%. [21]

A significant association between PXF and cataract was also noticed in the present study. 19 patients (32%) had an immature cataract, 36 patients (61%) had nuclear cataract and 4 patients (6%) had hypermature cataract and is consistent with findings in other studies. [22] These results were similar to the findings suggested by Shreya M et al, Thomas et al and studies done by Marium and Aurora. [13, 17, 23]

In the present study PXF material was found on the pupillary margin of iris in 13 patients and on anterior surface of lens in 20 patients. In 26 patients material was found on both the areas. PXF material was not found on the corneal endothelium. According to Thomas et al it was present on the pupillary margins of 65 (58.0%) eyes and on the lens of 71(63.4%), only on the lens surface in 48 (42.9%), only on the pupillary margins in 38 (33.9%), and in both locations combined in 26 (23.2%). [17] Similar

results were seen in a population based study done in central Iran and Shreya M et al. [20, 13]

Pseudoexfoliation has a strong association with glaucoma. In the study 42 patients (71%) had IOP less than 20 mm Hg, 11 patients (18.6%) had IOP more than 21 mm Hg. 6 patients (10%) presented with glaucomatous disc changes in patients with PXF. These findings were consistent with studies done by Shreya M et al (76% - IOP <20mm Hg, 13.29%- IOP between 20-30mm Hg, 10.12%- IOP>30mm Hg) [13] and Thomas et al (4.2%). [17]

In a population based study conducted in Andhra Pradesh a prevalence of 0.69% was observed. [17] In a hospital based study conducted in Jordan, the prevalence of pseudoexfoliation was 9.1%. [24] In agreement with findings in these reports, present study showed a prevalence similar to the study conducted in Andhra Pradesh.

5. CONCLUSION

To conclude the prevalence of pseudoexfoliation presented to OPD at RIMS, Kadapa was 0.6%. This rate was similar to other studies conducted in south India. A definite increase in the disease frequency was noted with age, so it seems to be a disease of senility. It is more common in males as compared to females.

Pseudoexfoliation material was most commonly found on the papillary margin of iris and the lens capsule. Pseudoexfoliation showed a unilateral involvement. Thus proper dilatation of pupils is needed to avoid missing diagnosis of PXF. PXF thus is an important cause for ocular morbidity. Ophthalmologists should focus on the detection of PXF especially considering the risks for operative complications related to pseudoexfoliation and the higher prevalence of glaucoma among these patients.

ACKNOWLEDGMENT: None

AUTHOR'S CONTRIBUTIONS

This work was carried out in collaboration between all authors. Author VV designed the study. Author wrote the protocol. Author SD wrote the first draft of the manuscript. Author PN managed the literature searches. Author SL performed the statistical analysis. All authors read and approved the final manuscript.

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