

An Observational Assessment of the Prevalence and Demographic Profile of Glaucoma in Pseudo Exfoliation Syndrome

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Conflict of interest: Nil

Abstract

Aim: To assess the prevalence and characteristics of glaucoma in Pseudo exfoliation syndrome.

Methodology: A total of 53 patients with pseudoexfoliation who came to the Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India from Feb 2018 to Jan 2019. were investigated and followed up for one year. All patients were subjected to complete ocular examination including visual acuity. All patients diagnosed as pseudo exfoliation syndrome with age group of 40-80 years. Patients with previous history of uveitis or ocular trauma and known cases of POAG and angle closure glaucoma who were on medication were excluded from this study. Pseudo exfoliation glaucoma was diagnosed on the basis of pseudoexfoliative material on slit lamp examination, IOP >21 mm Hg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, glaucomatous field defects on perimetry.

Results: Out of 53 patients 29 patients (54.7%) were males and 24 patients (45.3%) were females. 9.4% (5 cases) patients belonged to 41-50 years of age group, 30.2% (16 cases) belonged to 51-60 years, 45.3% (24 cases) belonged to 61-70 years, and 15.1% (8 cases) belonged to more than 70 years of age group. 50% patients had glaucoma out of 8 patients with pseudoexfoliation of more than 70 years of age followed by 45.83% in 61-70 years of age (11 glaucoma patients out of 24 patients with pseudo exfoliation) and 18.75% in 51-60 years of age (3 glaucoma patients out of 16 patients with pseudo exfoliation). Prevalence of glaucoma in pseudo exfoliation was 37.93% in males (11 out of 29 patients) and 29.17% in females (7 out of 24 patients)

Conclusion: Pseudoexfoliation syndrome (PXF) can lead to open angle glaucoma. All patients with pseudo exfoliation must undergo complete glaucoma evaluation for early detection and follow up. Patients with pseudo exfoliation alone without glaucoma must be followed every 6 months. In pseudo exfoliation patients with glaucoma the intraocular pressure must be checked after regular intervals.

Keywords: Pseudoexfoliation syndrome, glaucoma, intraocular pressure.

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Introduction

Pseudoexfoliation (PXF) syndrome is a common age-related disorder of the extracellular matrix that is frequently associated with severe chronic secondary open-angle glaucoma and cataract. PEX syndrome may affect up to 30% of people older than 60 in a worldwide distribution and is biomicroscopically diagnosed by abnormal fibrillar deposits on ocular structures that line the aqueous-bathed surfaces of the anterior segment [1].

The characteristic PXF fibrils appear to be multifocally produced by various intraocular cell types including the preequatorial lens epithelium, nonpigmented ciliary epithelium, trabecular endothelium, corneal endothelium, vascular endothelial cells, and virtually all cell types of the iris [2]. The characteristic tissue alterations predispose to a broad spectrum of intraocular complications including phacodonesis and lens subluxation, angle-closure glaucomas, melanin dispersion, insufficient mydriasis, blood-aqueous barrier dysfunction, posterior synechiae, and corneal endothelial decompensation [1, 2].

Since its first description in Finland by Lindberg [3] in 1917, pseudoexfoliation syndrome (PEX) and its relationship to glaucoma have been appreciated worldwide. Analysis of the grayish flecks found on the anterior segment structures of the eye and deposits in other organs reveal a substance resembling basement membrane [2]. Clinically, the pseudoexfoliation material can be seen deposited in the anterior segment on the pupillary ruff, the anterior lens capsule, and other anterior segment structures. On the anterior capsule it has a characteristic distribution of a central disc surrounded by a clear zone, surrounded by a peripheral ring-like deposit of granular material. Associated anatomical features include pupillary ruff atrophy, pigment dispersion and, commonly, elevated intraocular

pressures with or without glaucoma [5]. It has also been reported to be a risk factor for narrow angles and angle closure glaucoma (ACG) [6, 7].

Clinical course of pseudoexfoliation glaucoma (PXFGL) progresses more rapidly than primary open-angle glaucoma (POAG) [4]. In contrast to primary open angle glaucoma in which pressure raises slowly and insidiously, in pseudo exfoliation syndrome pressure rises drastically. This fibrillary material is insoluble in aqueous, gets filtered and deposited in trabecular meshwork. It leads to clogging of trabecular meshwork and impairment of blood aqueous barrier in turn leads to decrease in aqueous out flow and increase in Intra Ocular Pressure. It is also accompanied by pigment release from iris caused by rubbing of iris against deposits in lens capsule; these released pigments also contribute to the blockage of trabecular meshwork [8]. Angle closure glaucoma in pseudo exfoliation syndrome is rare. The mechanism of angle closure is pupillary block [9] produced by posterior synechiae, increased rigidity of iris and anterior movement of lens due to zonular weakness [10]. Hence the present study was conducted to assess the prevalence and characteristics of glaucoma in Pseudo exfoliation syndrome.

Materials and Methods:

A total of 53 patients with pseudoexfoliation who came to the Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India from Feb 2018 to Jan 2019

Inclusion criteria:

All patients diagnosed as pseudo exfoliation syndrome with age group of 40-80 years.

Exclusion criteria:

Patients with previous history of uveitis or ocular trauma and known cases of POAG and angle closure glaucoma that was on medication.

Methodology:

All patients were subjected to complete ocular examination including visual acuity, slit lamp examination, detailed ophthalmoscopes examination with direct ophthalmoscope, slit lamp bio microscopy with +90 dioptre lens and indirect ophthalmoscope, Intraocular pressure measurement, gonioscopy, pachymetry and Visual field examination with automated perimeter (octopus 301). Ultrasound B scan and ultrasound bio microscopy were done in selected patients who had opaque ocular

media. Pseudo exfoliation glaucoma was diagnosed on the basis of pseudoexfoliative material on slit lamp examination, IOP >21 mm Hg, glaucomatous cupping on fundus examination, pigmentation of trabecular meshwork on gonioscopy, glaucomatous field defects on perimetry.

Results:

Out of 53 patients 29 patients (54.7%) were males and 24 patients (45.3%) were females. 9.4% (5 cases) patients belonged to 41-50 years of age group, 30.2% (16 cases) belonged to 51-60 years, 45.3% (24 cases) belonged to 61-70 years, and 15.1% (8 cases) belonged to more than 70 years of age group.

Table 1: Demographic details

Variables		Number	%
Sex	Male	29	54.7
	Female	24	45.3
Age (in years)	41-50	5	9.4
	51-60	16	30.2
	61-70	24	45.3
	>70	8	15.1

50% patients had glaucoma out of 8 patients with pseudoexfoliation of more than 70 years of age followed by 45.83% in 61-70 years of age (11 glaucoma patients out of 24 patients with pseudo exfoliation) and 18.75% in 51-60 years of age (3 glaucoma patients out of 16 patients with pseudo exfoliation). Prevalence of glaucoma in pseudo exfoliation was 37.93% in males (11 out of 29 patients) and 29.17% in females (7 out of 24 patients)

Table 2: Prevalence of glaucoma in pseudoexfoliation

		Total patients	Patients with Glaucoma		Patients without Glaucoma	
			No.	%	No.	%
Age (in years)	41-50	5	0	0.00	5	100
	51-60	16	3	18.75	13	81.25
	61-70	24	11	45.83	13	54.17
	>70	8	4	50.00	4	50.00
Gender	Male	29	11	37.93	18	62.07
	Female	24	7	29.17	17	70.83
Total		53	18	33.96	35	66.04

Discussion:

Pseudoexfoliation syndrome (PXF) is an aging-related systemic disease with

cardiovascular and cerebrovascular morbidity [11] and hearing loss [12] but only ocular manifestations. It is the single most important risk factor for glaucoma

worldwide and a major factor predicting glaucoma progression [13].

In our study, 18 patients had glaucoma out of 53 patients having pseudoexfoliation. That means prevalence of glaucoma in pseudoexfoliation is 34% (approximately). The prevalence of glaucoma in pseudo exfoliation syndrome was 30% in some studies [14, 15] and 40- 50% in another study [16]. The incidence of glaucoma increases with age, similar to the study conducted in western India [17]. 88.89% of patients had open angle glaucoma and 11.11% of patients had angle closure glaucoma. Open angle glaucoma is common in pseudo exfoliation syndrome [18].

Dysregulation of elastic fiber production and cross-linking is thought to contribute to the etiology of PXF. The gene product of *LOXLI* is an enzyme that catalyzes elastin and collagen cross-linking and is an important mediator of elastin fiber biogenesis and homeostasis. *LOXLI* deficiency has been reported in the lamina cribrosa and is thought to contribute to instability in this region, leading to increased susceptibility to optic nerve damage [19].

A prospective 10-year follow-up study by Puska [20] involving patients with clinically unilateral PEX showed that glaucoma may develop in the contralateral eyes before there are any signs of clinical PEX. The relative risk of conversion to glaucoma was found to be dependent on initial IOP, degree of pupillary dilation, and difference in pressure between the fellow eyes. Signs of PXF syndrome often appear later in eyes first diagnosed as having POAG. It is not clear whether this reflects an inaccurate clinical diagnosis or coincidence of two different conditions. It is conceivable that an underlying defect in aqueous humor dynamics or additional involvement of a "glaucoma susceptibility gene" may predispose for glaucoma development in PXF eyes.

Conclusion:

From this study also, it can be concluded that pseudoexfoliation syndrome (PXF) can lead to open angle glaucoma. All patients with pseudo exfoliation must undergo complete glaucoma evaluation for early detection and follow up. Patients with pseudo exfoliation alone without glaucoma must be followed every 6 months. In pseudo exfoliation patients with glaucoma the intraocular pressure must be checked after regular intervals.

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