Journal of Case Reports and Scientific Images

E-ISSN: 2708-0064
P-ISSN: 2708-0056
JCRSI 2021; 3(1): 04-07
www.allcasereports.com
Received: 05-11-2020
Accepted: 15-12-2020

Dr. N Rajendran
Professor and Head of the Department, Sree Mookambika Institute of Medical Science, Kulasekaram, Tamil Nadu, India

Dr. Shruthy PS
Junior Resident, Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu, India

Dr. Biju Gopal
Junior Resident, Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu, India

Dr. V Divya
Junior Resident, Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu, India

Corresponding Author:
Dr. Shruthy PS
Junior Resident, Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu, India

A clinical study of glaucoma in pseudoexfoliation syndrome

Dr. N Rajendran, Dr. Shruthy PS, Dr. Biju Gopal and Dr. V Divya

DOI: https://doi.org/10.22271/27080056.2021.v3.i1a.22

Abstract
Background: Pseudoexfoliation is the common identifiable cause of secondary glaucoma. It is noted to be more aggressive with a high mean progression rate leading to full field blindness within 10 years.
Aim of study: The aim of this study is to assess the demographic aspects, magnitude, clinical spectrum and response to treatment of glaucoma in pseudoexfoliation syndrome.
Materials and methods: All patients with pseudoexfoliation syndrome who attended Ophthalmology department, Sree Mookambika Institute of medical sciences, Kulasekharam were selected for this study. This is a cross sectional study done over a period from January 2019 to June 2019 in patients who fulfilled the inclusion criteria. All patients have undergone complete ocular examination including visual acuity, slit lamp examination, Ophthalmoscopic examination, IOP measurement, Gonioscopy, Pachymetry and visual field examination and these patients were advised to follow up at regular intervals.
Observation and results: In this study of 96 patients, males with age group of 61-70 years are commonly affected. Pseudoexfoliation syndrome is unilateral on presentation but eventually becomes bilateral. The IOP is fluctuating and produce severe optic nerve damage. The course is aggressive and recalcitrant to treatment needs definitive surgical therapy.
Conclusion: Pseudoexfoliation is a common identifiable cause of secondary glaucoma producing ocular morbidity. Due to its fluctuating IOP, aggressive course and difficulty in managing with medical treatment it stands as a distinct enigmatic clinical entity. Pseudoexfoliation needs early detection, regular follow up and definitive therapy.

Keywords: Pseudoexfoliation, Glaucoma, Intra ocular pressure, Trabeculectomy

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 [1]. Pseudoexfoliation syndrome is a systemic micro fibrillopathy which targets ocular tissues through gradual deposition of proteinaceous material. This fibrillar material is produced by cells in the anterior segment in response to oxidative stress [2]. Clumps of fibrillar material released into extracellular spaces gets deposited into corneal endothelium, ciliary epithelium, trabecular meshwork, iris, anterior capsule of lens, zonules, anterior vitreous face and conjunctiva. Clinically these appear as greyish white flakes. This pseudoexfoliative material gets accumulated in the trabecular meshwork and leads to elevated intra ocular pressure which leads to glaucoma [3]. Systemically this exfoliative fibrillopathy has also been reported in skin, visceral organs and associated with an increasing number of vascular disorders, sensori neural hearing loss and Alzheimer disease [3, 4].

Materials and Methods
A total of 96 patients with pseudoexfoliation who attended the outpatient department of ophthalmology, Sree Mookambika Institute of medical sciences, Kulasekharam were selected for this study.
Demographic details of all patients were noted. Patients were subjected to detailed clinical history and complete ocular examination. Case sheet profroma were drawn up and details of each patient were recorded.

Complete ocular examination includes

a. Visual acuity: Visual acuity and best corrected visual acuity by snellen's visual acuity chart.
b. Anterior segment examination by slit lamp biomicroscopy and the following details were observed Conjunctiva–circum corneal congestion.

Cornea – edema, pseudoexfoliation material in endothelium and pigmentation.
Anterior chamber - depth, aqueous flare, pseudoexfoliation materials.
Iris – transillumination defects, pattern.
Pupil – size, pseudoexfoliation material in papillary margin, reaction to light.
Lens – exfoliation material in anterior lens surface, cataract association.

c. Intraocular pressure – measured with Goldmann Applanation tonometer. The values were taken after correcting the CCT.
d. Gonioscopy: Status of angles of anterior chamber examined with Goldmann three mirror gonioscope – grading was done according to Shaffer's criteria and presence of pseudoexfoliation material or pigmentation in angle is recorded.
e. Detailed fundus examination: By using direct ophthalmoscopy – changes in the optic disc, cup disc ratio, retinal nerve fibre layer damage, thinning of neuroretinal rim, shifting of retinal vessels were noted. Findings were confirmed by slit lamp biomicroscopy with + 78 dioptre lens and indirect ophthalmoscopy.
f. Central corneal thickness: Central corneal thickness measured by using pachymetry.
g. Visual field examination: Visual fields were assessed with automated perimeter (Humphrey field analyser)
h. Ultrasound B scan and ultrasound biomicroscopy in selected patients.

Complete ocular examination and measurements were done by a single person to avoid inter observer variations.
Pseudoexfoliation 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.

Inclusion criteria

a. All patients diagnosed as pseudoexfoliation syndrome with age group of 40-80 years.
b. Both males and females were included.
c. Unilateral and bilateral pseudoexfoliation cases were included.

Exclusion criteria

a. Patients with less than 40 years of age.
b. Patient with previous history of uveitis or ocular trauma
c. Patients with history of exposure to intense infrared lights i.e. glass blowing.
d. Patient with known cases of POAG and angle closure glaucoma who were on medication.

Results

This study includes 96 patients with pseudoexfoliation who came to the Department of Ophthalmology, January 2019 to June 2019 .Out of 96 patients 55 patients were male and 41patients were females.

Age distribution

Table 1: Age distribution of 96 patients

Age in years	No of cases	Percentage (%)
41 -50	6	6
51 – 60	34	36
61 – 70	47	49
71 – 80	9	9

In this study of 96 patients, prevalence of pseudoexfoliation was higher among the age group of 61-70years, accounting for 49% (47cases), followed by 36% (34 cases) among51-60 years. The youngest patient found in our study was 42 years and the oldest age of the patient was 80 years.

Table 2: Sex distribution

Sex	No of cases	Percentage (%)
Male	55	57
Female	41	43

In this study of 96 patients, 55 males and 41 females were having pseudoexfoliation. There was mild male preponderance noted in our study.

Table 3: Laterality

Laterality	No of cases	Percentage (%)
Unilateral	55	57
Bilateral	41	43

In this study of 96 patients 55 (57%) were found to have unilateral pseudoexfoliation and 41(43%) were found to have bilateral pseudoexfoliation. Unilateral pseudoexfoliation were having higher incidence than bilateral pseudoexfoliation.

Table 4: Glaucoma association

Age in years	Total No of pseudoexfoliation	Patients with glaucoma		Patients without glaucoma	
		No	%	No	%
41-50	6	0		6	100
51-60	34	12	35	22	65
61-70	47	19	40	28	60
71-80	9	4	44	5	56

In this study out of 96 patients, glaucoma was seen in 35 patients. The incidence of glaucoma according to this study was 36%.

Table 5: Intra ocular pressure

IOP (mmHg)	No of patients	Percentage (%)
<20	61	63.5
21-30	22	22.9
>30	13	13.6
TOTAL	96	100

In our study of 96 patients, 61 patients had an Intra ocular pressure less than 20 mmHg, 22 patients had an Intra ocular pressure 21- 30 mmHg and 13 patients had an Intra ocular pressure more than 30 mmHg. According to our study the raised intra ocular pressure was found in 35 patients.

Table 6: Optic nerve damage

CD ratio	No of patients	Percentage (%)
0.3	42	43.8
0.4-0.6	30	31.2
>0.6	24	25.0
Total	96	100

In our study of 96 patients 42 patients had cup disc ratio of 0.3, 30 patients had cup disc ratio of 0.4 -0.6 and 24 patients had cup disc ratio of more than 0.6.

Table 7: Grading of Angles

Angle	No of patients	Percentage (%)
0-1	4	4.2
2	8	8.3
3	27	28.1
4	57	59.4
Total	96	100

In this study 57 patients had an angle of grade IV, 27 patients had an angle of grade III, 8 patients had an angle of grade II and 4 patients had an angle of grade I.

Table 8: Type of glaucoma

Type of glaucoma	Male		Female	
	No	%	No	%
Open angle	22	63	9	25.6
Angle closure	2	5.7	2	5.7

According to our study of 96 patients 31 patients had an open angle glaucoma 4 patients had narrow angles with glaucoma. In the 31 patients of open angle glaucoma 22 patients were males and 9 patients were females. Hence pseudoexfoliation glaucoma is common among males.

Open angle glaucoma

Table 9: Open angle glaucoma and pseudoexfoliation

	Unilateral Glaucoma	Bilateral Glaucoma	Total
Unilateral PXF	13	1	14
Bilateral PXF	9	8	17
Total	22	9	31

Out of 22 patients with unilateral open angle glaucoma 13 patients had unilateral pseudoexfoliation and 9 patients had bilateral pseudoexfoliation. In 9 patients with bilateral open angle glaucoma. One patient had unilateral pseudoexfoliation and 8 patients had bilateral pseudoexfoliation. According to our study 71% of patients had unilateral glaucoma and 29% had bilateral glaucoma. Hence unilateral glaucoma is more common than bilateral glaucoma in pseudoexfoliation syndrome.

Table 10: Angle closure glaucoma

Angle closure glaucoma	No of Patients
Secondary angle closure	2
Primary angle closure	2

Out of 4 patients with angle closure glaucoma, two patients had subluxated lens there was no trauma in these patient. Two patients had primary angle closure glaucoma. The possible mechanism of angle closure could be pupillary block by anterior shift of iris lens diaphragm due to weakened zonules.

Table 11: Field Defects

Field defects	No of patients	Percentage (%)
Generalised depression	32	33
Arcuate scotoma	10	10
Double arcuate scotoma	7	7
Tubular vision	4	4

Out of 96 patients 53 patients had field defects. Among them 32 patients had generalised depression, 10 patients had arcuate scotoma, 7 patients had double arcuate scotoma, and 4 patients had tubular vision. In the remaining 43 patients fields were normal in 38 patients and not possible in 5 patients due to poor vision.

Table 12: Central corneal thickness

Central corneal thickness(CCT)	Value
Maximum CCT	0.580 mm
Minimum CCT	0.511mm
Mean CCT	0.539mm

In our study mean CCT value in patients with pseudoexfoliation was 0.539mm.

Discussion

Glaucoma is the silent thief of sight, because vision loss occurs gradually over a period of time, symptoms occur only when disease is advanced, early detection is the best protection.

In this study of 96 patients with pseudoexfoliation who presented to our institute, all were subjected for detailed evaluation and analysis regarding the age at presentation, gender, laterality, glaucoma association and type of glaucoma.

In our study the pseudoexfoliation syndrome is common in the age group of 61-70 years. As age increases there is an increased incidence of pseudoexfoliation which is comparable to Framinghem study [4, 5].

In our study Males were 57% and females were 43%. Clements and Luntz found higher incidence among males. Taylor and Resnikoff *et al*. reported pseudoexfoliation could be related to exposure to ultraviolet light and environmental factors.[6]In our region most of the patients are agricultural workers and the ultraviolet light exposure is more which may explain the higher incidence in males. Unilateral cases are having higher incidence than bilateral presentation, comparable to Henry *et al.* study [7, 8]. The unilateral cases have to be followed up due to possibility of becoming bilateral later in due course.

According to our study 88.5% had open angle glaucoma and 11.5% had angle closure glaucoma, thus open angle glaucoma is common in pseudoexfoliation syndrome In our study unilateral glaucoma is more common than bilateral glaucoma. Hence pseudoexfoliation is the commonest cause of unilateral secondary open angle glaucoma. In our study the cup disc ratio more than 0.6 was seen in 25% of patients. Hence the optic nerve damage is more in pseudoexfoliation as compared to POAG. In our study 61 patients had an IOP less than 20 mmHg, 22 patients had an IOP between 21-30mmHg and the rest of 13 patients had an intra-ocular pressure more than 30mm Hg. In our study the mean value of CCT in patients was 0.539mm, the highest CCT was 0.580 mm and lowest was 0.511mm which is similar to Hepsen *et al*. study [9, 10]. In our study, 60% of glaucoma

patients had field defects out of which four patients had tubular vision.

Conclusion

To conclude the study, it was found that the prevalence of pseudoexfoliation increases as the age advances and pseudoexfoliation is most often unilateral at the time of presentation but eventually becomes bilateral, hence the unilateral cases needs periodic follow up. The incidence of glaucoma is more in pseudoexfoliation and most of them have open angles. The glaucoma is more common in bilateral pseudoexfoliation than unilateral pseudoexfoliation. The unilateral glaucoma is commoner than the bilateral glaucoma. The intraocular pressure is having rapid rise, aggressive course and recalcitrant to treatment. The severity of optic nerve damage is more as compared to the primary open angle glaucoma and having advanced field defects. The pseudoexfoliation glaucoma has better response to combination drugs as compared to single drug. The need of surgical therapy to reduce intraocular pressure is high in pseudoexfoliation glaucoma. All patients with pseudoexfoliation should undergo complete glaucoma evaluation and early detection of glaucoma. The patients should be frequently followed up.

The intra ocular pressure should be rechecked every 3-6 weeks in patients with pseudoexfoliation glaucoma. Pseudoexfoliation syndrome with no evidence of glaucoma patients should be followed every 6 months as they are having increased risk of developing glaucoma. Pseudoexfoliation is an important cause of secondary open angle glaucoma. It is an important cause for ocular morbidity, because of high intra ocular pressure and difficult medical management it stands out and enigmatic clinical entity. In view of the high prevalence of glaucoma, severe damage to optic nerve increased need of surgical therapy and high risk of operative complications related to pseudoexfoliation Ophthalmologists should focus on the detection of pseudoexfoliation.

References

1. Lamba P. A Giridhar A: Pseudoexfoliation syndrome I.J.O, 1984, 32:169.
2. Aravind H, Raju P, Poul PG, Baskaran M, Ramesh SV, George RJ *et al*. Pseudoexfoliation in South India. Br J Ophthalmol 2003;87(11):1321-1323.
3. Davenger M, Ringvold A, Blika S. Pseudoexfoliation, IOP and glaucoma. Acta Ophthalmol (Copenh) 1991;69:569-573.
4. Shields MB. Clinical epidemiology of Glaucoma: In: AllinghamRR, Damji KF, Freedman S, Moroi SE, Rhee DJ. Shield's text book of Glaucoma. 6th ed. Philadephia. Lippincott Williams and Wilkins, 2011, 248-261.
5. Kahn HA, Leibowitz HM, Ganley JP, Kini MM, Colton T, Nickerson RS, *et al*. The Framingham Eye Study. I. Outline and major prevalence findings. Am J Epidemiol. 1977;106(1):17-32. Doi: 10.1093/oxfordjournals.aje.a112428. PMID: 879158.
6. Bourne RR, Taylor HR, Flaxman SR, Keeffe J, Leasher J, Naidoo K, *et al*. Vision Loss Expert Group of the Global Burden of Disease Study. Number of People Blind or Visually Impaired by Glaucoma Worldwide and in World Regions 1990 - 2010: A Meta-Analysis. PLoS One 2016;11(10):e0162229. Doi: 10.1371/journal.pone.0162229. PMID:27764086; PMCID: PMC5072735.
7. Lowe RF, Primary open angle glaucoma with capsular exfoliation of the lens. Br J Ophthalmol 1964;48:492-494.
8. Marshall H, Mullany S, Qassim A, Siggs O, Hassall M, Ridge B, *et al*. Cardiovascular Disease Predicts Structural and Functional Progression in Early Glaucoma. Ophthalmology 2021;128(1):58-69. doi: 10.1016/j.ophtha.2020.06.067. Epub 2020 Jul 28. PMID: 32730956.
9. Mitchell P, Wang JJ, Hourihan F. The relationship between glaucoma and pseudoexfoliation: Blue Mountain Eye Study. Arch Ophthalmol 1999;117:1319-1324.
10. Ringvold A. Epidemiology of pseudoexfoliation syndrome. Acta Ophthalmol Scand 1999;77(4):371-375.