Original Research Article

Pseudo exfoliation syndrome

Badrinath Talwar

Assistant Professor, Department of Ophthalmology, Kanachur Institute of Medical Sciences, Mangalore, INDIA.

Abstract

Background: Pseudoexfoliation syndrome (PES) occurs due to the deposition of a distinctive fibrillar material in the anterior chamber of the eye. The trigger for the production of PEX material remains to be identified. Limited study has compared clinical characteristics of Pseudoexfoliation cases with non pseudoexfoliation cases.

Keywords: Pseudoexfoliation, Hypertension, Glaucoma, Ischemic Heart Disease, Intraocular pressure

*Address for Correspondence:
Dr Badrinath Talwar, Assistant Professor, Department of Ophthalmology, Kanachur Institute of Medical Sciences, Mangalore, INDIA.
Email: badrikanachurophthal@gmail.com

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INTRODUCTION

Pseudoexfoliation (PEX) syndrome is the most common identifiable cause of open angle glaucoma worldwide.[1] It is a generalised disorder of the extracellular matrix characterised by the production of abnormal basement membrane-like material in several intraocular and extraocular tissues. The trigger for the production of PEX material remains to be identified. 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.[2] It has also been reported to be a risk factor for narrow angles and angle closure glaucoma (ACG).[3,4]The reported prevalences in different parts of the world have varied from 0% to 38% in different populations.[5–8] There are no population based data on the prevalence of this syndrome from the Indian subcontinent. In this study, we report the prevalence and characteristics of PEX syndrome in a rural population in southern India.

MATERIAL AND METHODS

This was descriptive cross-sectional study conducted in Ophthalmology department of Kanachur Institute of Medical Sciences, Mangalore. Minimum 189 sample size was obtained Patients who are 50 and above years of age, either gender residing within the catchment area of the tertiary care hospital were included and those who are not willing to participate, having traumatic cataract, uveitis were excluded. The WHO recommended sitting position and technique was used for measurement of blood pressure. The hypertensive status defined according Joint National Committee (JNC7) criteria and those individuals currently taking antihypertensive treatment. Arterial hypertension was diagnosed if average of two successive reading of systolic and diastolic blood pressure $\geq$ 140 and $\geq$ 90 respectively. Based on medical record and/or ischemic changes on electrogram (ECG) patients considered as known case of ischemic heart disease. Diabetes status was defined if the patient is a known case, taking oral hypoglycemic drugs and for suspected cases BSL fasting and post prandial was done. Consultation of General Medicine department was done for the diagnosis of systemic diseases. Hearing loss was assessed on audiogram by ENT specialist. Diagnosis of PEX was made by slit-lamp examination after diagnostic mydriasis with 01 drop of 0.5% tropicamide. The criterion used to diagnose PXS was the presence of pseudoexfoliation material on one or more anterior segment structures. Since the presence of pseudo exfoliative material on lens is the most consistent and prominent feature of PEX, so to prevent under estimation of the prevalence, all subjects who were psuedophakic or aphakic in any eye were excluded from the study The participants were classified as having PEX if any pseudoexfoliation material was present in at least one eye. Gonioscopy examination was done with the help of Goldman four mirror gonioscope, in a dark room and with use of short, narrow slit-beam to

avoid constricting of pupil and artificially opening the angle. Cornea was anaesthetized by instilling 0.5% proparacaine eye drops in conjunctival sac. The angle of anterior chamber was examined. A thorough examination including visual acuity, anterior segment and posterior segment examination, measurement of intraocular tension and, electrocardiogram, biochemical blood analysis, audiometry, and blood pressure examination was done for every patient.

RESULTS

Table 1: Age and Gender distribution of the participants (n=440)

Age Groups (Years)	Patients Groups		Frequency (%)
	PEX (%)	Non PEX (%)	
50-60 Yrs.	36 (16.36%)	41 (18.63%)	77 (17.26%)
61-70 Yrs.	50 (22.72%)	48 (21.81%)	98 (22.27%)
≥ 71 Yrs.	134 (60.90%)	131 (59.54%)	265 (60.22%)
Total	**220 (50%)**	**220 (50%)**	**440 (100%)**
Chi-Square (χ2) 3.99 d.f:02 P:0.81 non-Significant			
Gender	**PEX (%)**	**Non PEX (%)**	**Frequency (%)**
Male	139 (63.18%)	142 (64.54%)	281 (63.86%)
Female	81 (36.81%)	78 (35.45%)	159 (36.13%)
Total	**220 (50%)**	**220 (50%)**	**440 (100%)**
Fisher's Exact Test: P:0.84 non-Significant			

Table 2: Distribution of hearing loss & Glaucoma among patients (n=440)

Hearing Loss	Patients Groups		Frequency (%)
	PEX (%)	Non PEX (%)	
Present	51 (23.18%)	22 (10%)	73 (16.59%)
Absent	169 (76.81%)	198 (90%)	367 (83.40$%)
Total	**220 (50%)**	**220 (50%)**	**440 (100%)**
	Patients Groups		**Frequency (%)**
Glaucoma	**PEX (%)**	**Non PEX (%)**	
Present	34 (15.45%)	26 (11.81%)	60 (13.63%)
Absent	186 (84.54%)	194 (88.18%)	380 (86.36%)
Total	220 (50%)	220 (505)	440 (100%)

Table 3: Distribution of systemic diseases among the participants (n=440)

Systemic diseases	Patients Groups		Frequency (%)
	PEX (%)	Non PEX (%)	
HTN Present	48 (21.81%)	28 (12.72%)	76 (17.27%)
HTN Absent	172 (78.18%)	192 (87.27%)	364 (82.72%)
Fisher's Exact Test: P:0.016 Significant			
DM Present	14 (06.36%)	25 (11.36%)	39 (08.86%)
DM Absent	206 (93.63%)	195 (88.63%)	401 (91.13%)
Fisher's Exact Test: P:0.09 non-Significant			
IHD Present	37 (16.81%)	20 (09.09%)	57 (12.95%)
IHD Absent	183 (83.18%)	200 (90.90%)	383 (87.04%)
Total	**220 (50%)**	**220 (50%)**	**440 (100%)**
Fisher's Exact Test: P:0.02 Significant			
*HTN: Hypertension, DM: Diabetes Mellitus, IHD: Ischemic Heart Disease			

Table 4: Distribution of Gonioscope grades of the participants (n=440)

Gonioscope grades	Patients Groups		Frequency (%)
	PEX (%)	Non PEX (%)	
+ 1	00 (0.00%)	00 (0.00%)	00 (0.00%)
+ 2	07 (3.18%)	06 (2.72%)	13 (02.95%)
+ 3	26 (11.81%)	30 (13.63%)	56 (12.72%)
+ 4	187 (85.00%)	184 (83.63%)	371 (84.31%)
Total	**220 (50%)**	**220 (50%)**	**440 (100%)**

Table 5: Distribution of pseudoexfoliation deposit

Clock hours	On Lens Anterior capsule	On Pupillary margin of Iris	Frequency (%)
< 6	40 (37.03%)	33 (29.46%)	73 (33.18%)
> 6	68 (62.96%)	79 (70.53%)	147 (66.81%)
Total	**108 (49.09%)**	**112 (50.90%)**	**220 (100%)**

DISCUSSION

The reported prevalence rate of PEX syndrome in different populations shows extensive variations—0% in Eskimos,[5] 1.6% in a south eastern US population,[6] 1.8% in the Framingham Eye Study,[7] 5–25 % in the Scandinavian countries,[5] and 38% in Navajo Indians.[8] More recent population based estimates in Australia reveal prevalences of 0.98% in the Visual Impairment Project[10] and 2.3% in the Blue Mountains Eye Study.[11] These could reflect true variations arising from racial, genetic, and/or geographical differences. Some of the variability could be explained by differences in techniques of assessment and whether PEX was actively looked for with a dilated pupil. However, they could also be accounted for by many other factors including differences in study design (prospective versus retrospective), sampling methods (population based, hospital based, or clinic based), population size, and age distributions in the sampled populations. A literature search revealed only two reports on the prevalence of PEX syndrome in India. The first, by Sood and Ratnaraj in 1968, reported 1.87% prevalence in patients aged 45 years or above with a 34% prevalence of glaucoma in patients with PEX.[12] The last report on the subject is by Lamba and Giridhar in 1984,[13] who reported a 7.4% prevalence of PEX, 9% of whom had glaucoma. Both these were hospital based studies. The current study is the only population based study on PEX syndrome from India.

CONCLUSION

Pseudoexfoliation syndrome is the age-related systemic disorder with characteristic eye manifestations. In present study systemic diseases like heating loss, hypertension and IHD found to be more prevalent among PEX. Other illness like diabetes and glaucoma found to be more predominant in PEX than non PEX but the difference wasn't statistically significant. Glaucoma and changes due to systemic diseases found to be more prevalent in pseudoexfoliation patients. Further study will be required for better understanding of this senile disorder.

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