ORIGINAL ARTICLE

CLINICAL CHARACTERISTICS OF CATARACT PATIENTS WITH PSEUDOEXFOLIATION SYNDROME AT JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTH WEST ETHIOPIA

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ABSTRACT

BACKGROUND: Pseudoexfoliation is the most common identifiable cause of secondary glaucoma and pseudoexfoliation patients have higher rates of intraoperative and postoperative complications of cataract surgery compared to those without the condition. Hence, the objective of this study was to assess the clinical characteristics of pseudoexfoliation syndrome among cataract patients examined at Jimma University Specialized Hospital, Southwest Ethiopia.

METHODS: A cross-sectional clinic based study was conducted from January-March 2009. A total of 402 subjects with cataract were examined for the presence of pseudoexfoliation material, type of cataract, intraocular pressure, glaucoma and other factors. The presence of any exfoliation material on the iris, pupil and lens capsule was examined. Data were computed using SPSS version 16.0.

RESULTS: Out of the 402 patients examined, 144(35.82%) of them had presenile and senile cataract with pseudoexfoliation and out of these 144 cases, 48(33%) were unilateral and 96(66.7%) were bilateral. Furthermore, 41(28.5%) cases had raised intraocular pressure, of which 2(4.9%) cases had chronic angle closure glaucoma and 39(95.1%) of the cases had open angle pseudoexfoliative glaucoma. There was also lens sublaxation in 10(6.9%) of the cases and dislocation in 6(4.2%) of the cases. The prevalence of PEX was higher (41%) in the age group of 70 years and above followed by 60-69 years (27.8%).

CONCLUSION: A significant number of patients with PEX had poor zonular integrity and high IOP and/or glaucoma. Population based studies are recommended to assess its prevalence in the general population and its association with cataract and glaucoma.

KEYWORDS: Pseudoexfoliation, cataract, glaucoma

INTRODUCTION

Pseudo exfoliation syndrome (PEX) is a systemic condition associated with a lysyl oxidase-like1 (LOXL1) genetic defect, usually identified in person over 50 years of age and characterized by the deposition of a distinctive fibrillar material in the anterior segment of the eye (1,2). The pseudoexfoliative material is a grey-white, fibrillogranular, extracellular PAS positive matrix composed of a core of protein surrounded by glycosaminoglycans (1). Pseudoexfoliation syndrome (PEX) is frequently associated with open angle glaucoma, known as pseudo exfoliation glaucoma, which is the most common identifiable form of secondary open angle glaucoma worldwide (3). Exfoliation syndrome is a unilateral or bilateral disorder that becomes more apparent with increasing age (4) and with geographical and racial clustering (5).

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Poor zonular integrity may give rise to phacodonosis, lens sublaxation/dislocation and an increased incidence of zonular dialysis and vitreous loss during cataract extraction and hence affect cataract surgery technique and IOL implantation (1, 4). The prevalence of pseudo-exfoliation syndrome varies considerably among different ethnicities ranging from near zero in Eskimos to nearly 30% in people in Scandinavian countries (6).

As far as the researchers' knowledge is considered, there has not been a study conducted regarding the prevalence of the syndrome in the study setting and therefore this study would establish the prevalence of PEX and its clinical characteristics in the local clinical setting and would also help to design strategies to reduce postoperative complications.

PATIENTS AND METHODS

A cross-sectional clinic based study was conducted on all cataract patients from January 18-March 19, 2009 in Jimma University Specialized Hospital (JUSH), Department of Ophthalmology, Jimma town, Oromiya region, southwest Ethiopia. All patients who visited the Eye Clinic for visual/eye problem during the study period were examined by the investigators. Only patients with presenile and senile cataract and have Pseudoexfoliation in one eye or both eyes were included and patients with congenital or developmental, juvenile, traumatic and other causes of cataract were excluded from this study as pseudoexfoliation is common with increasing age, and trauma and other causes of cataract would affect the clinical characteristics of cataract patients with pseudoexfoliation syndrome.

Data were collected using structured questionnaire which comprised of sociodemographic characteristics like age, sex, occupation, educational status; and clinical characteristics like visual acuity, intraocular pressure, anterior chamber depth, presence or absence of pseudoexfoliative materials, type of glaucoma, presence/absence of lens sublaxation/dislocation and presence /absence of systemic illness (diabetes, hypertension).

Visual acuity testing was performed at a distance of 6 meters using Snellens or illiterate E charts. The lowest line read successfully was assigned as the visual acuity for the eye undergoing testing. The right eye was tested first followed by the left eye, each time occluding the fellow eye. The intraocular pressure (IOP) was measured using Schiotz tonometer where two readings were taken and the average measurement was recorded. Anterior segment examination of the eye, and the presence or absence of pseudoexfoliative materials on the cornea, iris, pupil and crystalline lens were determined using slit lamp biomicroscope. Anterior chamber depth was assessed using Van-Herrick grading method and patients with grade II and less underwent gonioscopic examination with single mirror goniolens to assess the angle structure. Dilated optic disc evaluation for glaucomatous disc damage was carried out for patients having IOP of higher than 21mmHg. The data were checked for its completeness, accuracy, clarity and consistence every day by the investigator. Finally, the data were entered to a computer and analyzed using SPSS for windows version 16.0 software.

The study was approved by the Student Research Program of Jimma University and verbal informed consent was obtained from individual patients by explaining the purpose of the study and no obligation or force was imposed on the study subjects.

The following operational definitions were used in this study.

- Cataract: Dense lens opacity that can explain the reduction of vision
- Pseudoexfolitaive glaucoma (PXG): An open angle glaucoma in which there is evidence of PEX in the anterior segment of the eye
- Chronic angle closure glaucoma (CACG): It refers to an eye with glaucoma in which portions of the anterior chamber angle are closed permanently by peripheral anterior synechiae (PAS). In cases of PXG with secondary angle closure due to zonular laxity, the asymmetry in anterior chamber depth was used as the key to distinguishing it from primary angle closure glaucoma (PACG) besides the presence of pseudoexfoliative material in the anterior segment of the eye.

RESULTS

Four hundred and two patients with presenile and senile cataract were screened, of which 227 (56.5%) were males and the rest 175 (43.5%) females. Forty one per cent (59) of cataract patients with PEX were in the age group 70 years and above followed by age group 60-69 which accounted for about 28% ; and about 38% of them were farmers by occupation as shown in table 1.

Table 1. Socio-demographic characteristics of patients with pseudoexfoliation, Department of Ophthalmology, Jimma University Specialized Hospital, 2009.

Item		Number (N=144)	Percent
Age (year)	**40-49**	14	9.7
	50-59	31	21.5
	60-69	40	27.8
	70+	59	41.0
Sex	**Male**	99	68.7
	Female	45	31.3
Occupation			
	Farmers	54	37.5
	Retired	53	36.8
	Housewives	29	20.1
	Employee	5	3.5
	Merchants	3	2.08
Educational Status			
	Illiterates	118	81.94
	Read & write	18	12. 5
	Grade 5-8	4	2. 8
	Grade 9-12	2	1. 4
	12+	2	1. 4

PEX was present in 144 patients with over all prevalence of 35.82%. Male patients with PEX were 99 (68.75%) and females 45 (31.25%). The prevalence of PEX was higher (41%) in the age group of 70 years and above followed by age group of 60-69 years (27.8%), 50-59 years (21.5 %), and 40-49 years (9.7%) (table1). Furthermore, patients with PEX had different presentation of exfoliation material in the anterior segment of the eye; 92.4% on the pupillary margin, 2% on the iris, 2.8% on the anterior lens capsule and 2.8% on the pupil and the lens.

Forty one (28.5%) cases had raised IOP; in which 2 (4.9%) cases had chronic angle closure glaucoma (CACG) and 39 (95.1%) cases had open angle pseudoexfoliative glaucoma (PXG). Forty (27.8%) cases had moderate to severe visual impairment (visual acuity < 6/18-3/60) and the rest 84 (58.3%) cases were blind (visual acuity < 3/60) (Table 2).

Table 2. Clinical characteristics of patients with pseudoexfoliation, Department of Ophthalmology, Jimma University Specialized Hospital, 2009.

Item	Number (N=144)	Percent
Visual Acuity		
≥ 6/18	20	13.9
< 6/18-3/60	40	27.8
< 3/60	84	58.3
IOP		
10-21	103	71.5
>21	41	28.5
Glaucoma type*		
PXG	39	27.1
CACG	2	1.4
AC depth (Van-Herrick)		
Grade I	0	0.0
Grade II	2	1.4
Grade III	142	98.6
Grade IV	0	0.0
Systemic illness**		
HPN	9	6.3
DM	4	2.8
HPN and DM	1	0.7
No systemic illness	130	90.3
Zonular Integrity		
Lens sublaxation		
Yes	10	6.9
No	134	93.1
Lens dislocation		
Yes	6	4.2
No	138	95.8

**PXG= Pseudoexfoliative glaucoma; CACG = chronic angle closure glaucoma*

*** HPN = hypertension; DM= diabetes mellitus*

Among the 144 patients with PEX, about 11 % (16) had poor zonular integrity; which was reflected by lens sublaxation in 10 (6.9%) cases and lens dislocation in 6 (4.2%) cases. Moreover, the majority of the cases 142 (98.6%) had an AC depth of Grade III and 2 (1.4%) cases had Grade II by Van-Herrick method and angle closure by gonioscopic examination.

Regarding associated known systemic diseases, 9 (6.3%) cases had hypertension, 4 (2.8%) of them had diabetes mellitus and 1 had both hypertension and diabetes mellitus. Furthermore, out of the 144 cases, 48 (33.3%) of them had unilateral PEX while 96 (66.7%) of them had bilateral as shown in table 3.

Table 3. Sex, age and laterality of PEX, Department of Ophthalmology, Jimma University Specialized Hospital, 2009.

Item		PEX		Total	
		Unilateral	Bilateral	No	%
Sex	Male	34	65	99	68.75
	Female	14	31	45	31.25
Age	40-49	4	10	14	9.7
	50-59	12	19	31	21.5
	60-69	11	29	40	27.8
	70+	21	38	59	40
Total		48	96	144	100

The prevalence of nuclear cataract was found to be high (41%) followed by mature cataract (20.8%), cortical cataract (12.5%), nuclear and cortical cataracts (11.8%), posterior subcapsular cataract (PSC) and hypermature cataract (each 6.3%) and PSC and nuclear cataract (1.4%).

DISCUSSION

The overall prevalence of PEX in this study was found to be 35.82% which is comparable to other similar study conducted at Menellik II Hospital which reported 39.3% (7) and higher than other reports from European countries (8); 4.7% in England, 6.3% in Norway, 4% in Germany, 1.1% in Greece and 5,5% in France and in Asian countries; 0.4% in China (9), 0.69% in South India (10), 6.45% in Pakistan (11) and 21.3% in Jordan (12). This extensive variation in the prevalence might be attributed to racial difference/ regional gene pools and environmental influences.

It was also found that the prevalence of PEX increases with age where it was 9.7% among those aged 40-49 years, 21.5% among those aged 50-59 years, 27.8% among those aged in 60-69 years and rose to 41% among those aged 70 years and above. The picture is similar to other studies done in different part of the world. In Reykjavik's study (13), the prevalence increased from 2.5% among those aged 50-59 years to 40.6% among those age 80 years and above. In Toronto(14) the prevalence of PEX was high in patients over 65 years at 11.5 % and at 4.1% over 45 years and in USA (15) the prevalence of PEX to be 0.6% in 52-64 years old, rising to 5% in 75-85 years old.

Out of the 144 patients, PEX was bilateral in 96(66.7%) of the cases and unilateral in 48 (33.3%) of the cases which are comparable to findings of the study done in Menellik II Hospital (7) where PEX was bilateral in 62.2% of the cases. Our finding is also similar to the report of a Hospital based study in Pakistan (16) in which PEX was bilateral in 76.9% of the cases and unilateral in 23.1% of the cases. This is expected as the disease process is invariably bilateral pathologically as shown by Prince et al (17).

Forty one (28.5%) of the cases had raised IOP of which two (4.9%) had chronic angle closure glaucoma and 39 (95.1%) had open angle PXG. The percentage of raised IOP in our study is lower than the finding in a hospital based study conducted in Pakistan (18) in which 63% of the

cases had raised IOP, 9.7% had angle closure glaucoma and 90.2% had PEX (open angle) glaucoma. This difference could be due to the difference in the number of cases with PEX between the two studies where only 85 cases had PEX in the Jordan study.

The prevalence of nuclear cataract was higher as compared to other different types of cataract in patients with PEX (41%) which is similar with other study reports in south India (10), Brumse (19) and Srilanka (20).

In conclusion, the prevalence of PEX among patients with presenile and senile cataract in our setting was high and occurred at a relatively younger age. It was higher in the age group of 70 years and above followed by age group of 60-69 years and the signs of PEX were seen bilaterally. Furthermore, a significant number of patients with PEX had poor zonular integrity and high IOP and or glaucoma.

We recommend that cataract patients with PEX syndrome should be properly evaluated preoperatively for the presence of zonular weakness and high IOP and/or glaucoma as it will play a vital role in the plan of cataract surgery and informing the patient about possible surgical complications and other surgical intervention that might be needed during and after surgery. The diagnosis of PEX is also of paramount importance in the detection and management of glaucoma. Further hospital based and population based studies should be done to assess the prevalence of PEX among the general population and its association with cataract, glaucoma, socio-demographic correlates and other ocular or systemic factors.

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