

Prevalence of Glaucoma Capsulare and Cataract in Patients with Ocular Pseudo Exfoliative Syndrome

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Abstract

Introduction: Pseudoexfoliation is a complex ocular disorder having increased production and accumulation of fibrillar material in the anterior segment of eye. It is more commonly seen with increasing age. Lindberg was the first author to observe pseudo-exfoliation material in 50% of his glaucoma patients. Vogt observed these findings with open angle glaucoma and proposed the name 'glaucoma capsulare'. *Aims and Objectives:* To find the prevalence of glaucoma capsulare and cataract in patients with pseudo-exfoliation syndrome in the population visiting Mamata Medical College and General Hospital, Khammam. *Materials and Methods:* This was a prospective, one year study conducted in the department of Ophthalmology, Mamata Medical College, Khammam. The study population consisted of 90 patients of ocular pseudoexfoliative syndrome. Complete ocular examination was done in all subjects to detect glaucoma capsulare and cataract. *Observations and Results:* The incidence of glaucoma capsulare and cataract in PES was 18.05% and 81.94% respectively. Glaucoma capsulare increased with increasing age, was more common in males and more often unilateral. Mean Intra-ocular pressure in glaucomatous eyes was 33.82 (SD±10.79) mm of Hg. Visual acuity was poor in these patients because of cataract, glaucoma or both. More the number of pseudo-exfoliation syndrome signs and less the angle width, the higher the chances of raised intra-ocular pressure was noted. ($p < 0.001$). *Conclusions:* Glucomacapsulare and cataract are common in patients having pseudoexfoliation syndrome. Glaucoma capsulare becomes more common with increasing age, affects males more than females, is more often unilateral, leading to poor visual acuity and its risk increases with the severity of pseudoexfoliation. Appropriate ophthalmologic evaluation of patients with pseudoexfoliation syndrome is recommended at an early stage so as to prevent complications.

Keywords: Pseudo Exfoliation Syndrome; Glaucoma Capsulare; Cataract; Visual Acuity.

Introduction

Pseudoexfoliation is a complex ocular disorder having increased production and accumulation of fibrillar material in the anterior segment of eye. It is more commonly seen with increasing age. The association of glaucoma with pseudo-exfoliation syndrome is a well-known fact. Lindberg [1] was the first author to observe pseudo-exfoliation material in 50% of his glaucoma patients. Vogt [2] observed these findings with open angle glaucoma and proposed the name 'glaucoma capsulare'. The

association of glaucoma and cataract with pseudo-exfoliation syndrome (PES) is well-known.

Aims and Objectives

To find the prevalence of complications, especially

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glaucoma capsulare and cataract in patients with pseudo-exfoliation syndrome in the population visiting Mamata Medical College and General Hospital, Khammam.

Materials and Methods

This was a prospective study carried out over a period of one year in the department of Ophthalmology, Mamata Medical College and associated General Hospital, Khammam. In this study 90 individuals, above the age of 40 years, were selected randomly. The inclusion criteria were that all the patients had pseudo exfoliation syndrome in one or both the eyes. The patients having traumatic,

infective and inflammatory eye conditions were excluded.

Firstly, Visual acuity of both eyes was recorded. Both eyes were examined with flash torch light and Haagstreit slit lamp bicroscope for signs of pseudo-exfoliation syndrome. Then gonioscopic examination was done with Goldman three mirror gonioscope. Xylocaine (4%) eye drops were instilled in the conjunctival sac to anesthetize the cornea. Gonioscope filled with 2% methylcellulose, was applied over the cornea and angle of anterior chamber was examined. The following findings were noted:

Pseudo-exfoliation material deposits over angle and ciliary body, Sampaolesi's line and width of angle of anterior chamber as described by Shaffer [3].

Grade 0	0°	Iridocorneal contact Closed angle
Grade 1	10°	Schwalbe's line and Very narrow Part of trabecular angle Meshwork visible
Grade 2	10°-20°	Trabecular-meshwork Moderately Visible narrow
Grade 3	20°-35°	Scleral spur visible Moderately wide angle
Grade 4	35°-40°	Ciliary body visible wide angle

Then the pupils were dilated by one to two drops of 10% phenylephrine or 1% tropicamide or both. The patients were re-examined again for presence of Pseudoexfoliation. Intra-ocular pressure of both eyes was recorded with the help of applanation tonometer after anaesthetizing the cornea with 4% Xylocaine drops in conjunctival sac. Fundus oculi, the optic cup and disc, retinal vessels were examined in all cases. In advanced senile cataract cases, the fundii were examined after cataract surgery. Visual field examination was done in all glaucomatous patients on Goldmann perimeter. Lens was with Haagstreit slit lamp bicroscope.

Observations and Results

The present study had 90 individuals. There were total 144 eyes with Pseudoexfoliation as some patients had both eye involvement by Pseudoexfoliation.

Incidence of Glaucoma Capsulare in Pseudoexfoliation Syndrome

In the present study, 26 (18.05%) out of 144 eyes

had pseudo-exfoliation glaucoma with IOP > 22 mm Hg and field of vision and fundus oculii changes. Three eyes (2.08%) had IOP > 22 mm of Hg with no field and fundus oculii changes and were labelled as ocular hypertension. 115 (79.86%) eyes had normal IOP (< 22 mm of Hg). The mean age for occurrence of pseudo-exfoliation glaucoma was 66.10 (SD ± 8.99) years and mean IOP was 33.82 (SD ± 10.79) mm of Hg.

Age and Sex Variation in Pseudo-Exfoliation Glaucoma

Six of the 27 females (22.22%) who had pseudo-exfoliation syndrome had glaucoma. Similarly, 20 of 63 (31.74%) male patients of pseudo - exfoliation showed glaucoma. Thus, pseudo - exfoliation glaucoma was more common in males than females (1.43:1).

The mean age for onset of glaucoma in males was 65.59 (SD ± 8.05) years and in females 61.98 (SD ± 11.62) years.

Laterality

Unilateral pseudo-exfoliation glaucoma was more common than bilateral. Out of 26 patients, unilateral

glaucoma was seen in 16 (67.53%) and bilateral in 10 (38.96%) patients. The ratio between unilateral to bilateral pseudo-exfoliation glaucoma was 1.73:1.

Unilateral glaucoma in males was detected at the mean age of 64.93(SD±6.66) and in females, at 61.02 (SD±9.64) years. Bilateral glaucoma in males occurred at the mean age of 66.31(SD±5.92) and in females, at 61.82 (SD+/-11.2) years.

Visual Acuity

Out of 21 glaucoma patients (42 eyes), 26 eyes were having glaucoma capsulare. Out of them, 6 eyes (23.07%) had no perception of light, 14 (53.84%) had vision 3/60 to PL +, 5 (19.23%) eyes had 6/36 and 1 (3.84%) eye had 6/36 to 6/6 vision.

Table 1: Incidence of glaucoma in relation to age, gender and laterality

Age	Male Unilateral	Bilateral	Female Unilateral	Bilateral	Total
40-49	0	0	0	2	2
50-59	1	0	0	0	1
60-69	7	4	0	2	13
70-79	5	2	2	0	9
80 And Above	1	0	0	0	1
Total	14	6	2	4	26
Percentage	53.84 %	23.07%	7.69%	15.38%	100%

Table 2: Visual status in glaucoma capsulare patients

Visual Acuity	PL-Neg.to PL+ PR accurate	HMCF to 3/60	4/60 to 6/36	6/24 to 6/6	Total	%
Glaucoma	1	4	1	1	7	16.66
Cataract	1	4	6	5	16	38.11
Both glaucoma and cataract	5	10	4	0	19	45.23
Glaucoma%	23.07	53.84	19.23	3.84	42	100

Both eyes glaucoma 5 cases = 18.18%
 Total glaucoma % = 19+7 = 26 (61.9%)
 Total cataract % = 19+6 = 35 (83.33%)

Fundus Oculii

Out of 26 glaucomatous eyes, fundus could be visualized on dilatation of pupil in 19 eyes only. Variable glaucomatous cupping; ranging from cup to disc ratio (C:D ratio) of 0.4 to 0.9 were seen. All cups had larger diameter, other characteristic of the cups seen in these eyes was nasal shifting of vessels. In rest of the 7 eyes fundus details were obscured.

Visual Fields

Out of 26 eyes having pseudo-exfoliation glaucoma; visual fields examination could be carried out only in 3 eyes since rest of the eyes had poor vision due to cataract or glaucoma itself. All above three eyes examined showed glaucomatous field defects- 2 had Bjerrum's scotoma and 1 eye had only temporal island of vision.

Relation of Raised IOP to Angle Status

Out of 144 eyes (of 90 patients) having pseudo-exfoliation syndrome, 91 eyes had grade 4, open angle, 39 eyes had grade 3, 8 eyes had grade 2 and 6 eyes had grade 1 open angle. 3 cases of ocular hypertension were recorded out of which one eye showed angle grade 3 and 2 eyes had open angle grade 4. Among 26 glaucomatous eyes, 17 had grade 4, 5 eyes had grade 3, 2 eyes had grade 2 and another 2 eyes had grade 1 anterior chamber angle width.

Frequency of Pseudo-Exfoliation Signs in 144 Eyes

Out of 144 eyes, 22 eyes had 1-2 number of pseudo-exfoliation signs; 29 eyes had 3-4 signs, 38 had 5-6; 48 had 7-8 and 7 eyes had 9-10 signs of pseudo-exfoliation syndrome. The signs of PES were 1. Pseudo-exfoliation on pupillary margin 2. Pseudo-exfoliation on anterior surface of lens 3. In pupillary

area 4. In retro-iridial portion 5. Degranulation of pupillary ruff 6. Pigment deposition on trabeculum 7. Pseudo-exfoliation at angle 8. Pigment on corneal endothelium 9. Sampaolesi's line 10. Pigment on anterior surface of lens

Out of 144 eyes, 115 had IOP <22 mm of Hg with

no signs of pseudo-exfoliation glaucoma. Twenty nine eyes showed IOP > 22 mm and signs of glaucoma in the optic fundus. Three eyes had IOP >22 but <30 mm of Hg and no signs of pseudo-exfoliation glaucoma and were labeled as cases of ocular hypertension.

Table 3: Relation of raised Intraocular Pressure to Angle Status and Frequency of Signs in Pseudo-exfoliation Syndrome

No. of signs of PES	Angle status grade and number of eyes affected								Subtotal		
	Grade 4		Grade 3		Grade 2		Grade 1		N	H	
	N	H	N	H	N	H	N	H			
1,2	12	0	9	0	1	0	0	0	22	0	22
3,4	17	2	7	0	1	0	2	0	27	2	29
5,6	19	5	10	1	2	0	0	1	31	7	38
7,8	22	9	6	5	2	2	2	0	32	16	48
9,10	2	3	1	0	0	0	0	1	3	4	7
Total	72	19	33	6	6	2	4	2	115	29	144

N: normal IOP, H: high IOP

Table 4: Incidence of IOP in Relation to Age, Sex and Laterality

Age	Males		Females		Total No. of eyes
	Unilateral	Bilateral	Unilateral	Bilateral	
40-49	-	-	-	2	2
50-59	1	-	-	-	1
60-69	7	4	-	2	13
70-79	8	2	2	-	12
80 and above	1	-	-	-	1
Total	17	6	2	4	29

IOP Status in Eyes with Pseudo-Exfoliation Syndrome

Among 90 patients, 144 eyes showed varied number of signs of pseudo-exfoliation. Out of them, 22 eyes presented with 1 – 2 signs and among them no eye (0%) had high IOP, 29 eyes who presented

with 3 – 4 signs had high IOP in 2 eyes (6.90%), 38 eyes with 5 – 6 signs showed high IOP in 7 eyes (18.42%), 48 eyes with 7 – 8 signs had high IOP in 16 eyes (33.33%) and 7 eyes who showed 9 – 10 signs presented with high IOP in 4 eyes (57.14%).

Table 5: Relation of Number of Signs of PES to IOP Status

No. of signs of PES	Total No. of eyes	No. of eyes with high IOP	%	Mean age, SD
1,2	22	0	0%	51.23+/-6.18
3,4	29	2	6.90%	60.02+/-9.31
5,6	38	7	18.42%	60.52+/-8.24
7,8	48	16	33.33%	65.73+/-8.83
9,10	7	4	57.14%	67.83+/-8.66
Total	144	29	20.14%	66.10+/-8.99

IOP: intraocular pressure. SD: standard deviation

Incidence of Cataract and Glaucoma in Pseudoexfoliation Syndrome

The incidence of cataract in pseudo- exfoliation syndrome 118 (81.94%) eyes out of 144 having pseudo-exfoliation syndrome had changes from early lenticular opacities to mature cataract.

Discussion

Relation between Pseudo-Exfoliation and Glaucoma

The most important complication of pseudo-exfoliation syndrome is glaucoma capsulare. The development of glaucoma was first postulated and

later demonstrated by Vogt [2] He found that pseudoexfoliation material created obstruction at the angle of anterior chamber, leading to glaucoma. According to Sampolesi et al [4] Glaucoma capsulare is secondary type of glaucoma in which pseudo-exfoliation material and pigment granules obstruct the trabecular meshwork.

Schlötzer-Schrehardt et al [5] have postulated an underlying defect of the outflow channels. This theory was verified by Leyden et al [6] by finding a unilateral pseudo-exfoliation and bilateral glaucoma.

The incidence of glaucoma capsulare in pseudo-exfoliation syndrome has been reported by various authors and has wide variations. Vogt [2] found glaucoma capsulare in 75% cases of pseudo-exfoliation syndrome in Switzerland. Incidences reported from other places are 72% in England by Roche [7] 20-25% in UK by Hansen et al, [8] 32.5% in India by Sood et al, [9] 8.1% in Australian aborigines by Taylor et al, [10] 75% in USA by Kozart et al [11] 9% in India by Lamba et al, [12] 63% in Japan by Shimizu et al [13] and 18.8% in Shimla Hills of India by Sharma et al [14].

Incidence of glaucoma capsulare was more in females than in males as observed by Roche [7] Smith [15] and Yanoff [16]. But others studies by Aasved [17] and Kozart et al [11] found no variation of incidence among either sex. Higher incidence among men was reported by Lowe [18]. The mean age of onset of glaucoma capsulare in pseudoexfoliation syndrome as reported by Lowe [18] is 73 years and by Smith [15] is 69 years.

Onset of glaucoma occurred within five years in 7-20% and within 10 years in 9-24% as reported by Hansen et al [8] and within 10 years in 15% of cases as reported by Leyden et al [6].

Glaucoma occurs more commonly in eyes with PES than in those without it. Elevated IOP with or without glaucoma occurs in about 25% of persons having PES. The clinical course and prognosis are much worse in exfoliative glaucoma than in primary open-angle glaucoma. Also the problems of optic nerve damage, visual field damage, poor response to medications and surgical interventions are more common. Persons with elevated IOP and PES are much more likely to develop glaucomatous damage on long-term follow-up than those without PES [14, 19].

Several authors have observed higher intraocular pressure in pseudo-exfoliation glaucoma than in primary open angle glaucoma [6, 11, 17]. Optic nerve damage was more pronounced and earlier in PES glaucoma than primary open angle glaucoma [6, 16,

17].

Sampolesi [20] reported heavy pigment desposition over trabecular meshwork in pseudoexfoliation syndrome as a pigmented line and he called that pigmented line as 'Sampolesi's line'. He found it in 83% of PES glaucoma cases. Later this observation was confirmed by Horven [21] who found its presence in 77% of glaucoma capsulare cases. Moreno - Montanes et al [22] suggested a highly significant correlation between elevated IOP and the degree of pigmentation of the meshwork.

The apparent production of pseudoexfoliation material by trabecular cells not only causes mechanical obstruction but also may be responsible for development of a special type of secondary open-angle glaucoma in PES syndrome [5].

Patients with pseudo-exfoliation syndrome respond poorly to medical therapy as compared to laser trabeculoplasty and trabeculectomy [6, 21, 23]. The disappointing results in pseudo-exfoliation glaucoma were explained due to delayed diagnosis, the tendency to ever higher intraocular pressure, early optic nerve damage in these eyes and failure to recognize the conditions earlier by its quiescent nature. Many investigators have advised to make a thorough search for this condition, close follow up and early management of the disease [15, 21].

PES is the only common glaucoma which usually affects only one eye or affects one eye long in advance of the other. Anyone over age 50 with unilateral glaucoma should be suspected of having PES. When only one eye is clinically involved, the fellow eye often has abnormal aqueous humor dynamics or glaucomatous damage [19].

Incidence of Glaucoma Capsulare

The incidence of glaucoma capsulare is quite variable. Aasved et al [17] reviewed the incidence in world literature and found it ranging from 0-93%. These figures included the pseudo-exfoliation syndrome incidence in population as well as in glaucoma clinics. However, we reviewed the pseudo-exfoliation glaucoma incidence in hospital visiting population studies, which is as follows:-

In the present study of 144 eyes, glaucoma capsulare was seen in 26 (18.05%) eyes and ocular hypertension in 3 (2.08%) eyes. Lamba et al [12] observed 9% incidence of glaucoma capsulare and 1.7% of ocular hypertension. On the other hand, Kozart et al [11] observed 7% incidence of glaucoma capsulare and 15% of ocular hypertension in pseudo-exfoliation syndrome. Similarly, Klemetti [23]

Table 6: Incidence of Glaucoma Capsulare in Hospital Visiting Population

Study	Country	Incidence of Glaucoma (%)
Sood et al [9]	India	32.5%
Kozart et al [11]	USA	7.0%
Lamba et al [12]	India	9.0%
Sharma et al [14]	North India	18.0%
Klemetti et al [23]	Finland	4.0%
Thomas et al [24]	South India	5.5%
Present study	South India	18.0%

reported incidence of 4% glaucoma capsulare and 44% ocular hypertension. Sharma et al [14] did a study in Shimla, North India, and observed glaucomacapsulare in 18.82% and ocular hypertension in 1.76% of PES cases, which compares well with the present study from South India.

Incidence of glaucoma capsulare is nearly two times in the present study as compared to the incidence reported by Lamba et al [12]. However, the incidence of ocular hypertension is again much lower in both the studies, whereas, incidence of ocular hypertension is much higher in the studies by Kozart [11, 23]. The possible explanation is that in the Indian milieu, the patients report very late at an Ophthalmological centre, by which time a considerable number of patients who had been having ocular hypertension, had turned into overt glaucoma cases and add up to the latter figure.

Age Variation in PES Glaucoma

The onset of glaucoma capsulare usually occurs in 6th decade of life [13]. Lowe [18] reported the mean age of onset of glaucoma at 73 years, Sharma et al [14] at 63.04 (SD+/-7.4). In the present study, mean age for onset of glaucoma was 63.24 (SD±7.96) years which compares well with the figure of Shimizu et al from Japan [13]. Thus, our findings show that onset of glaucoma capsulare is comparatively at an earlier age than other countries of the west.

Gender Variation in PES Glaucoma

The incidence of glaucoma capsulare has been reported higher in males by Hansen et al [8] Roche, [7] Smith, [15] Lamba et al, [12] Shimizu et al [13] and Sharma et al [14]. Present study showed 31.74% incidence of glaucoma capsulare in males and 22.22% in females (ratio 1.43:1). This is quite in agreement with above enumerated studies.

However, Aasved et al [17] and Leyden et al [6] found no significant difference between the two sexes. The possible explanation of this variation is again, perhaps the difference of parameters of the

samples studies.

Laterality in Glaucoma Capsulare

In the present study unilateral glaucoma was seen in 61.54% and bilateral in 38.46% out of the 26 patients with pseudo-exfoliation syndrome. Kozart et al [11] reported incidence of 76% unilateral and 24% bilateral glaucoma capsulare in their patients of pseudo-exfoliation syndrome. Sharma et al [14] reported 66.6% unilateral and 33.4% bilateral glaucoma capsulare. Thus, higher incidence of unilateral glaucoma capsulare in the present series compares well with above authors. Lamba et al [12] have also reported unilateral glaucoma capsulare more common than bilateral, but these authors have not given the exact incidence. However, some authors [7] have reported bilateral glaucoma capsulare more common than unilateral but such reports are very few.

In females, bilateral glaucoma capsulare is more common than males. In the present study, 66.66% glaucoma patients had bilateral glaucoma capsulare in females and 30% in males. So there is significantly higher incidence of bilateral glaucoma capsulare in females than males ($p < 0.05$). Similar findings were reported by Kozart et al [11] who observed 67% bilateral glaucoma capsulare in females and 33% in males. Sharma et al [14] also reported bilateral involvement in 55.6% females and 25% males. Thus, we are quite in agreement with the observations of above authors. But it is difficult to postulate why PES: bilateral glaucoma incidence is so high in females than males.

In this study, mean age of onset of unilateral glaucoma was 63.8 (SD±8.1) years and of bilateral glaucoma 65.16 (SD±9.2) years. Kozart et al [11] reported mean age of 71 years for onset of unilateral glaucoma capsulare and 72.5 years for bilateral glaucoma. Sharma et al [14] reported 63.8 years for onset of unilateral and 65.16 years for onset of bilateral PES. No such figures are available in other studies from this country for comparison.

Intraocular Pressure in PES Glaucoma

Mean intra-ocular pressure in the present study

was 33.82 (SD±10.79) mm of Hg in glaucoma capsulare patients, which was quite high. Many authors have also noted higher intra-ocular pressure levels in glaucoma capsulare as compared to primary open angle glaucoma [6, 8, 14, 17, 23]. A definite cause had not been found for higher intra-ocular pressure levels in glaucoma capsulare but blockade of trabecular meshwork with pigment granules is the most likely cause [11, 23].

Visual Acuity in PES Glaucoma

Visual acuity was found to be quite poor in our glaucoma capsulare patients. 23.07% eyes had complete glaucomatous optic atrophy and no perception of light; 53.84% were economically blind (vision 3/60), 19.23% were having vision 3/60 to 6/60 and in 3.84% eyes vision was 6/24 to 6/6. The cause for poor vision was senile cataract or glaucoma capsulare or both. Roche[7] reported that 37% eyes had poor to worse vision in glaucoma capsulare. Sharma et al [14] reported that 53.1% were economically blind among patients of glaucoma capsulare. Thomas et al [24] reported poor vision (no perception to light) in 20.5% of pseudoexfoliation cases and significantly impaired vision (<6/60) in 24.65%. Thus, our observations compare well with the above authors and we conclude that glaucoma capsulare is much more devastating to the eye for visual prognosis.

Visual Fields in PES Glaucoma

In most of cases visual fields couldn't be charted because of poor vision due to either glaucoma or accompanying cataract. Out of 26 eyes having glaucoma capsulare, visual field could be examined only in 3 eyes. All these showed glaucomatous field defects - two eyes had Bjerrum's scotoma and other had only a temporal island of vision left. Early damage of optic nerve head in glaucoma capsulare leading to early visual field defects is a well-known fact [6, 7, 14, 23]. Similar finding in the present study further substantiates this observation.

Relation of Glaucoma to Frequency of Signs and Angle Status

We tried to correlate the number of signs of pseudoexfoliation syndrome and angle width, on one hand, to the raised intra-ocular pressure and on the other, to frequency of signs of PES in the 144 affected eyes. The study revealed that highest incidence of raised intra-ocular pressure occurred in the eyes having maximum number of signs and minimal width of angle (Grade 1 open). The converse is also

true i.e. minimum incidence of raised intra-ocular pressure occurred in the eyes having minimum number of signs of pseudo-exfoliation syndrome and maximum angle width. If the angle status of the eye is ignored, then incidence of eyes having raised intra-ocular pressure (more than 22 mm of Hg) increased as the number of signs of pseudo-exfoliation syndrome increased. Raised intra-ocular pressure was noticed in 57.14% eyes having 9-10 signs of pseudo-exfoliation syndrome, in 33.33% eyes having 7-8 signs; in 18.42% eyes having 5-6; in 6.90% eyes having 3-4 and 0% in eyes having 1-2 signs. This suggests that more the number of signs of pseudoexfoliationsyndrome, more are the chances of raised intra-ocular pressure.

As expected, the raised intro-ocular pressure was found more often in the eyes having minimal angle width. Raised intra-ocular pressure was found in 33.3% eyes with grade 1 angle of anterior chamber, 25% in grade 2, 15.38% in grade 3 and 20.87% in grade 4 wide angles. The above correlation proves that an eye which has a narrow angle width and more number of signs of pseudo- exfoliation syndrome is at a much greater risk to develop glaucoma. In other words more angle width provides inbuilt protection from development of glaucoma against the severity of the pseudo-exfoliation syndrome, if number of signs is any indication of the severity of the disease.

Relation of Cataract to Pseudoexfoliation Syndrome

In the present study, 118 out of 144 eyes examined (81.94%) with pseudo-exfoliation syndrome had cataract. Cataract is known as a most common and frequent associated condition with pseudo-exfoliation syndrome. Usually it is nuclear type, but cortical type can also be present. Lindberg [1] reported 20% incidence of cataract in pseudo-exfoliation syndrome, while Sood et al, [9] 34.6% nuclear cataract and 23.1% cortical type. Thomas et al [24] in south India reported 46.7% incidence of cataract in pseudo-exfoliation syndrome.

Since senile cataract and pseudo-exfoliation syndrome are essentially age related degenerative diseases, it is possible that the latter process enhances the former, whenever the two conditions co-exist.

Conclusions

Glucomacapsulare and cataract are common in patients having pseudoexfoliation syndrome. Glaucoma capsulare becomes more common with increasing age, affects males more than females, it is

more often unilateral, leading to poor visual acuity and its risk increases with the severity of pseudoexfoliation. Appropriate ophthalmologic evaluation of patients with pseudoexfoliation syndrome is recommended to detect these lesions at an early stage so as to prevent complications.

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