

# FREQUENCY OF PSEUDOEXFOLIATION SYNDROME AT PRINCE ALI HOSPITAL, KARAK - JORDAN

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## ABSTRACT

**Objective:** To determine the frequency of pseudoexfoliation syndrome at Prince Ali Hospital Karak-Jordan.

**Methods:** This study was conducted by the ophthalmology clinic at Prince Ali Hospital in Karak province, between November 2003 to February 2004. A total of 400 consecutive patients aged 40 years or above attending the eye clinic were included in the study.

**Results:** The frequency of pseudoexfoliation syndrome in Karak was found to be 21.3% in subjects 40 years of age and above, 27.4% for patients 50 years of age or above.

**Conclusion:** Further studies in other parts of Jordan are needed to determine the incidence and prevalence of Pseudoexfoliation syndrome in Jordan.

**Key words:** Pseudoexfoliation, Glaucoma, Prevalence.

JRMS June 2005; 12(1): 15-17

## Introduction

Pseudoexfoliation syndrome (XFS) was first described in 1917 by Lindberg<sup>(1)</sup> in Finnish population. It is the most common identifiable cause of open angle glaucoma worldwide<sup>(2)</sup>. The clinical diagnosis is made by the presence of typical pseudoexfoliation material (PXM) on the anterior lens capsule surface and at the pupillary margin. In addition to PXM, other features include endothelial pigmentation, loss of pupillary ruff, iris transillumination, Sampaolesi's line, and pigment deposition in the trabecular meshwork<sup>(3)</sup>. PXS is associated with various ocular complications. Elevated intraocular pressure (IOP) and glaucomatous nerve damage had been demonstrated in patients with PXS<sup>(4-6)</sup>. Cataracts were reported to be more common in patients with XFS<sup>(7)</sup>. Unfavorable factors such as poor mydriasis<sup>(6,8-10)</sup>, higher rate of vitreous loss<sup>(9,10)</sup>, zonular weakness<sup>(9-12)</sup>, corneal endotheliopathy<sup>(13)</sup>, capsular phimosis, and opacification<sup>(14)</sup> have all been reported in relation to cataract surgery in these patients. PXM has been identified in various tissues in patients with ocular XFS<sup>(15)</sup>. Systemic associations reported include angina, hypertension, myocardial infarction, stroke, and abdominal aortic aneurysm<sup>(16)</sup>. The exact etiology and pathogenesis remain largely unknown<sup>(17)</sup>. Hypothesis

of an accumulation of basement membrane components such as fibrillin has been proposed<sup>(18)</sup>. It is a generalized disorder of the extracellular matrix characterized by the production of abnormal basement membrane-like material in several intraocular and extraocular tissues. The trigger for the production of PXM remains to be identified. Clinically, the PXM 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<sup>(19)</sup>. It has also been reported to be a risk factor for narrow angles and angle closure glaucoma (ACG)<sup>(6,20,22)</sup>.

The prevalence of XFS in various populations has varied from 0% to 38%<sup>(22-31)</sup>, and were reported to be: England 4%<sup>(22)</sup>, Germany 4.7%<sup>(22)</sup>, Norway 6.3%<sup>(22)</sup>, Eskimos 0%<sup>(23)</sup>, Russia 12%<sup>(23)</sup>, Finland 22%<sup>(23)</sup>, Iceland 29%<sup>(23)</sup> and 30%<sup>(24)</sup>, Iran 9.6%<sup>(25)</sup>, South Eastern United States 6%<sup>(26)</sup>, Navajo Indians 38%<sup>(27)</sup>, China 0.4% above 60 years of age<sup>(28)</sup>, South India 3.8%<sup>(29)</sup>, Black south Africans 7.7% in Hlabisa and 6.0% in Temba<sup>(30)</sup>, and in France 5.5%<sup>(31)</sup>.

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Manuscript received July 13, 2004. Accepted November 4, 2004

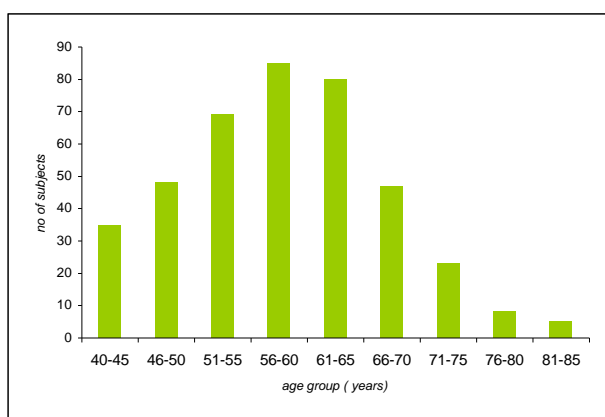
## Methods

A total of 400 consecutive patients attending the eye clinic at Prince Ali Hospital between November 2003 to February 2004, and aged 40 years or above, were examined for the presence of pseudoexfoliation. The relevant medical and ocular history was recorded. Eye evaluation included the visual acuity, slit lamp examination of the anterior segment with special attention to the endothelium, pupillary margin, anterior capsule with/without dilatation, and I.O.P. XFS was diagnosed clinically by the presence of typical PXM on the anterior capsule or at the pupil border, with or without pigment deposition on the corneal endothelium. Glaucoma was diagnosed by the presence of characteristic glaucomatous nerve damage and/or field loss associated with raised IOP.

The collected data was analyzed according to age, gender, and laterality.

## Results

The total number of patients included in this study was 400 [800 eyes], 169 (42.3%) males and 231 (57.7%) females, with age range from 40 to 85 years (Fig. 1). XFS was found in 85 (21.3%) patients [115 eyes (14.3%)], 35 (20.7%) males and 50 (21.7%) females. The youngest age found to have XFS was 50 years. No subjects under this age were found to have PXS. The ocular involvement was bilateral in 30 subjects (7.5% of all subjects and 35.3% among those with pseudoexfoliation (PXF); 12 (40%) females and 18 (60%) males, and it was unilateral in 55 subjects (13.8% among all subjects and 32.5% among those with PXF); 38 (69.1%) females and 17 (30.9%) males, and involving right eye in 35 (63.6%) subjects and left eye in 20 (36.4%) subjects.



**Fig. 1.** Age distribution of the study population

The mean age of the study population was 58.9 years. The mean age of subjects found to have PXS was 63 years, while the mean age of subjects without XFS was 57.8 years.

The mean age of females and males with XFS was 58.3 and 69.7 years respectively, however, the mean age

of females and males included in the study was 52.03 and 64.62 years respectively.

Among the 115 eyes with PXF, 27 eyes (23.5%) were already diagnosed to have pseudoexfoliation glaucoma, while 6 more eyes (5.2%) were discovered to have it. So a total number of 33 eyes (28.7%) were found to have glaucoma.

## Discussion

The prevalence rate of XFS in different populations shows extensive variations – from 0% in Eskimos<sup>(23)</sup> to 38% in Navajo Indians<sup>(27)</sup>. These variations arise from racial, genetic, and /or geographical differences. Unfortunately, no reports are available in the literature on the prevalence of PXF from Arab nations. In our study, the frequency was found to be 21.3% in Karak, in patients 40 years of age and older, and 27.4% in patients 50 years and older. No significant sex predilection was found, and this agrees with the results of other international studies<sup>(3,29)</sup>. This implies a high prevalence of pseudoexfoliative glaucoma in this part of Jordan (27.8%), and this needs to be confirmed and more elaborated on in another study. The mean age of subjects with XFS was found to be 63.0 years, and, considering age specific prevalence rates, there was a significant linear increase in prevalence with age (as shown in Table I). It is well known that the prevalence of XFS increases with age<sup>(5,26,29)</sup>.

**Table I.** Age groups, frequency and percentage XFS.

Age group (years)	Population	No. of patients with XFS	%
40-45	35	0	0
46-50	48	1	2.1
51-55	69	9	13
56-60	85	22	25.9
61-65	80	24	30.0
66-70	47	16	34
71-75	23	8	34.8
76-80	8	3	37.5
81-85	5	2	40.0
Total	400	85	21.3

No significant age difference was found between bilateral and unilateral cases, and this is similar to those of other studies<sup>(29)</sup>.

Further studies in other parts of Jordan are needed to determine the incidence and prevalence XFS in Jordan.

## References

1. **Lindberg JG.** Kliniska undersökningar över depigmenteringen av pupillarranden och genomlysbarheten av iris vid fall av aldersstarr samt i normala ögon hos gamla personer. Helsinki, Finland: Helsinki University, 1917; [Thesis]
2. **Ritch R, Schlotzer-Schrehardt U.** Exfoliation (Pseudoexfoliation) syndrome: Toward a new understanding. *Acta Ophthalmol Scand* 2001; 79: 213-217.

3. **Prince AM, Ritch R.** Clinical signs of the pseudoexfoliation syndrome. *Ophthalmology* 1986; 93: 803-807.
4. **Davanger M, Ringvold A, Bilka S.** Pseudoexfoliation, IOP and glaucoma. *Acta Ophthalmol* 1991; 69: 569-573.
5. **Mitchell P, Wang JJ, Hourihan F.** The relationship between glaucoma and Pseudoexfoliation. The Blue Mountains Eye Study. *Arch Ophthalmol* 1999; 117: 1319-1324.
6. **Layden WE, Shaffer RN.** Exfoliation syndrome. *Am J Ophthalmol* 1974; 78: 835-841.
7. **Hirvela H, Luukinen H, Laatikainen L.** Prevalence and risk factors of lens opacities in the elderly in Finland. *Ophthalmology* 1995; 102: 108-117.
8. **Carpel EF.** Pupillary dilatation in eyes with pseudoexfoliation syndrome. *Am J Ophthalmol* 1988; 105: 692-694.
9. **Avramides A.** Cataract surgery and lens implantation in eyes with exfoliation syndrome. *J Cat Ref surg* 1997; 23: 583-587.
10. **Lumme P, Laatikainen L.** Exfoliation syndrome and cataract extraction. *Am J Ophthalmol* 1993; 116: 51-55.
11. **Allen JS.** Zonular dialysis in pseudoexfoliation syndrome. *Arch Ophthalmol* 1987; 105: 1318-1319.
12. **Shlotzer-Shrehardt U, Naumann GOH.** A histopathologic study of zonular instability in pseudoexfoliation syndrome. *Am J Ophthalmol* 1994; 118: 730-743.
13. **Wang L, Yamasita R, Hommura S.** Corneal endothelial changes and aqueous flare intensity in pseudoexfoliation syndrome. *Ophthalmologica* 1999; 213: 387-91 (Med).
14. **Kuchle M, Amberg A, Martus P, et al.** Pseudoexfoliation syndrome, and secondary cataract. *Br J Ophthalmol* 1997; 81: 862-866
15. **Shlotzer-Schrehardt U, Kocar MR, Naumann GOH, et al.** Pseudoexfoliation syndrome: Ocular manifestation of a systemic disorder? *Arch of Ophthalmol* 1992; 110: 1752-1756.
16. **Schumacher S, Schlotzer-Schrehardt U, Martus P, et al.** Pseudoexfoliation syndrome and aneurysms of the abdominal aorta. *Lancet* 2001; 357: 359-360.
17. **Damji KF, Bains HS, Stefansson E, et al.** Is pseudoexfoliation syndrome inherited? A review of genetic and nongenetic factors and a new observation. *Ophthalmic Genetics* 1998; 19: 175-185.
18. **Schlotzer-schrehardt U, von der Mark K, Sakai LY, et al.** Increased extracellular deposition of fibrillin-containing fibrils in pseudoexfoliation syndrome. *Invest Ophthalmol Vis Sci* 1997; 38: 970-984.
19. **Ritch R.** Exfoliation Syndrome. In: Ritch R, Shields MB, Kruoim T, editors. *The glaucomas*, 2<sup>nd</sup> ed. St Louis: Mosby, 1996; 993-1022.
20. **Wishart PK, Spaeth GL, Poryzees EM.** Anterior chamber angle in pseudexfolioiation syndrome. *Br J Ophthalmol* 1985; 69: 103-107.
21. **Gohdo T, Takahashi H, Ijima H, et al.** Ultrasound biomicroscopy of angle closure glaucoma with pseudoexfoliation syndrome. *Br J Ophthalmol* 1997; 81: 705.
22. **Aasved H.** The geographical distribution of fibrillographia epitheliocapsularis, so-called senile exfoliation or pseudoexfoliation of the anterior capsule. *Acta Ophthalmol* 1969; 47: 792-810.
23. **Forsius H.** Prevalence of pseudoexfoliation of the lens in Finns Lapps, Icelanders, Eskimos and Russians. *Trans Ophthalmol Soc* 1979; 99: 296.
24. **Allingham RR, Loftsdottir M, Gottfredsdottir MS, et al.** Pseudoexfoliation syndrome in Icelandic families. *Br J Ophthalmol* 2001; 85: 702-707.
25. **Nouri-Mahdavi K, Nosrat N, Sahebghalam R, et al.** Pseudoexfoliation syndrome in central Iran: a population-based survey. *Acta Ophthalmol Scand* 1999; 77: 581-584.
26. **Cashwell LF, Shields MB.** Exfoliation syndrome; prevalence in a southeastern United States population. *Arch Ophthalmol* 1988; 106: 335-336.
27. **Faulkener HW.** Pseudoexfoliation of the lens among Navajo Indians. *AM J Ophthalmol* 1971; 72: 206.
28. **Young AL, Tang WW, Lam DSC.** The prevalence of pseudoexfoliation in Chinese people. *Br J Ophthalmol* 2004; 88: 193-195.
29. **Arvind H, Raju P, Paul PG, et al.** Pseudoexfoliation in south India. *Br J Ophthalmol* 2003; 87: 1321-1323.
30. **Rotchford AP, Kirwan JF, Johnson GJ, Roux P.** Exfoliation syndrome in black South Africans. *Arch Ophthalmol* 2003; 121(6): 863-870.
31. **Ritch R.** Exfoliation syndrome: Clinical findings and occurrence in patients with occludable angles. *Trans Am Ophthalmol Soc* 1994; 92: 845-944.