

Pseudoexfoliation Syndrome Prevalence in Somali Patients with Senile Cataract

Senil Kataraktı Olan Somalili Hastalarda Psödoeksfoliasyon Sendromu Prevalansı

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ABSTRACT

Introduction: To evaluate the prevalence and demographic data of Pseudoexfoliation syndrome (PEX) in Somali patients with age-related cataract surgery.

Methods: The study included 110 eyes of 110 patients planned for undergoing cataract surgery. Slit lamp biomicroscopy was used for classifying the cataract as nuclear, cortical, mature or hypermature. Goldmann applanation tonometer was used to measure the intraocular pressure. The inclusion criteria were: age >50 years, surgical indication because of age-related cataract (severity of lens opacification ≥ 2 in Lens Opacity Classification System III) and visual acuity <3/10. Pseudoexfoliation was defined as the presence of a different-looking fibrillar white substance that formed an almost complete ring on the lens surface or on the pupillary edge.

Results: The prevalence of PEX was 40.9% (45/110). It was bilateral in 71.1% (32/45) of the cases. The mean age of the sample was 67.4 ± 8.9 ; however, that of patients with PEX (71.3 ± 7.2 years) was significantly higher than in patients without it (64.7 ± 9 years) ($p < 0.05$). The prevalence of PEX was higher in patients with mature cataract ($p < 0.05$) and older age ($p = 0.01$). Mean intraocular pressure was higher in eyes with pseudoexfoliation syndrome (23.3 ± 3.5 mmHg) than in those without it (14.3 ± 4.2 mmHg); and this finding was statistically significant ($p < 0.05$).

Conclusion: PEX is a common condition in the Somali population. It is associated with ageing, mature and hypermature type of cataracts, glaucoma and increased intraocular pressure.

Keywords: Cataract, PEX, pseudoexfoliation, somalia, sub-saharan africa

ÖZ

Amaç: Yaşa bağlı katarakt cerrahisi planlanan Somalili hastaları da psödoeksfoliasyon sendromu (PEX) prevalansını ve demografik verilerini değerlendirmektir.

Yöntemler: Çalışmaya katarakt operasyonu için hazırlanan 110 hastanın 110 gözü dahil edildi. Katarakt tipi, yarık lamba biyomikroskopisi ile nükleer, kortikal, matur veya hiper matur olarak sınıflandırıldı. Hastaların göz içi basıncı, Goldmann aplanasyon tonometresi ile ölçüldü. Çalışmaya dahil edilme kriterleri 50 yaşın üzerinde olma, yaşa bağlı katarakt tanısı nedeni ile cerrahi endikasyonu olma (Lens Opasite Sınıflandırma Sistemi III'de şiddetinin ≥ 2 olması) ve görme keskinliğinin 3/10'un altında olmasıydı. Psödoeksfoliasyon, lens yüzeyinde veya pupiller kenarda neredeyse tam bir halka oluşturan farklı görünümlü fibriller beyaz bir maddenin varlığı olarak tanımlandı.

Bulgular: PEX prevalansı %40,9 idi (45/110). Olguların %71,1'inde (32/45) PEX bilateral idi. Yüz on olgunun ortalama yaşı $67,4 \pm 8,9$ idi. PEX'li hastaların yaş ortalaması ($71,3 \pm 7,2$ yıl), olmayan hastaların yaş ortalamasından yüksekti ($64,7 \pm 9$ yıl) ve istatistiksel olarak anlamlıydı ($p < 0,05$). Matur kataraktlı hastalarda daha fazla PEX mevcuttu ($p < 0,05$). Ortalama göz içi basıncı, PEX'li gözlerde ($23,3 \pm 3,5$ mmHg), PEX olmayan gözlerde ($14,3 \pm 4,2$ mmHg) göre daha yüksekti ve bu istatistiksel olarak anlamlıydı ($p < 0,05$).

Sonuç: Somali popülasyonunda PEX sık görülen bir durumdur. PEX yaşlanma, matur ve hiper matur tipte katarakt, glokom ve artmış göz içi basıncı ile ilişkilidir.

Anahtar Kelimeler: Katarakt, PEX, psödoeksfoliasyon, somali, sahra altı afrika



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Cite this article as/Atıf: Kalaycı M. Pseudoexfoliation Syndrome Prevalence in Somali Patients with Senile Cataract. Istanbul Med J 2020; 21(5): 380-3.

Received/Geliş Tarihi: 16.02.2020
Accepted/Kabul Tarihi: 30.07.2020

Introduction

Pseudoexfoliation is a condition characterized by accumulation of extracellular fibrillar material in systemic tissues and eyes. It is present in the eye, on the lens surface, lens zonules, iris surface, corneal endothelium, trabecular meshwork, pupil edge and anterior hyaloid surface (1). Aging is an important risk factor in the development of Pseudoexfoliation syndrome (PEX) and cataracts. The incidence of PEX is positively correlated with age. Increased lens opacity has also been associated with PEX (2).

The presence of PEX is etiologically associated with cataract, lens subluxation, retinal vein occlusion, open-angle glaucoma, and closed-angle glaucoma (3). In addition, it is known that the frequency of complications of zonular detachment, posterior capsule rupture and vitreous loss during cataract extraction in PEX eyes increases compared to normal eyes (4).

Pseudoexfoliation glaucoma is more severe than primary open-angle glaucoma in terms of clinical course and prognosis (5). Pseudoexfoliation glaucoma has much worse visual field and higher optic nerve damage during diagnosis than primary open-angle glaucoma. This may be due to higher and greater fluctuations in pseudoexfoliation glaucoma.

Epidemiological data on the prevalence of PEX is best obtained from population-based research, but useful information on the prevalence of PEX can be obtained from different subgroups of a population such as cases of cataracts and glaucoma (6).

Our clinical observation led us to believe that the prevalence of PEX among Somali people is relatively high. As a result of this situation, we aimed to investigate the prevalence of PEX in a prospective study in Somali patients who were scheduled to undergo cataract surgery.

Methods

This hospital-based prospective study was conducted according to the principles of the Declaration of Helsinki and received the approval of the Ethics Committee of the Recep Tayyip Erdoğan Training and Research Hospital of Somalia Mogadishu Turkey (decision no: 172, date: 25.11.2019). Written informed consent was obtained from the patients and their families before any examination or treatment was performed.

Our hospital, which is located in Mogadishu, the capital of Somalia and is the only tertiary health center in the country, is a reference hospital

where patients are transferred from all over the country and was opened with the help of the Republic of Turkey to serve the entire Somali population. At the same time, the appointment of specialist doctors for the training of Somali assistant doctors is done by the Ministry of health of the Republic of Turkey temporarily and periodically (4 months). During November 2019 - February 2020, 110 eyes of 110 patients admitted to the eye outpatient clinic of Mogadishu Turkey Training and Research Hospital in Somalia with low vision, diagnosed with cataracts and prepared for the operation were included in this study. The age and gender of the patients were recorded. Cataract type of all patients were classified as nuclear, cortical, matur and hypermature by slit lamp biomicroscopy. Intraocular pressure (IOP) was measured with Goldmann aplanation tonometer.

The criteria to be included in the study were; being over 50 years of age, being a surgical indication for age-related cataract diagnosis (intensity ≥ 2 in Lens Opacite Classification System III) and visual acuity below 3/10. Patients suspected of glaucoma (optic nerve head abnormalities, history of glaucoma and IOP > 21 mmHg) were screened for this disease according to the criteria of the International geographical and epidemiological Society of Ophthalmology (7). Patients with a history of eye trauma and/or surgery, congenital cataracts, drug-related cataracts, and uveitis-related cataracts were excluded from the study.

Pseudoexfoliation was described as the presence of a distinctive-looking fibrillar white substance that forms an almost complete ring on the lens surface or pupillary edge (8). All cases were examined by fundus with detailed optic nerve examination. Fully invisible nerves were evaluated using B-mode ultrasonography.

Statistical Analysis

Statistical analyses were performed using IBM SPSS version 23.0 (SPSS v.23.0, Illinois, USA). Comparisons between the two groups were calculated using the Pearson chi-square test. The frequency analysis was done by chi-square testing. $P < 0.05$ was considered statistically significant.

Results

The prevalence of PEX was 40.9% (45 out of 110 eyes). In 71.1% (32/45) of cases, PEX was bilateral. The mean age of 110 patients was 67.4 ± 8.9 years (51-88 years) (Table 1). The mean age of PEX patients (71.3 ± 7.2 years) was significantly higher than the average age of non-PEX patients

Table 1. Prevalence of pseudoexfoliation syndrome by gender and age

	PEX				Total	%	p
	Yes	%	No	%			
51-60	4	(12.9)	27	(87.1)	31	(28.2)	<0.05
61-70	13	(41.9)	18	(58.1)	31	(28.2)	
71-80	25	(59.5)	17	(40.5)	42	(38.2)	
>80	3	(50)	3	(50)	6	(5.5)	
Mean age	71.3 \pm 7.2	-	64.7 \pm 9	-	67.4 \pm 8.9	-	<0.05
Female	18	(36.7)	31	(63.3)	49	(44.5)	0.425
Male	27	(44.3)	34	(55.7)	61	(55.5)	

PEX: Pseudoexfoliation syndrome

(64.7±9 years) (p<0.05). PEX prevalence was positively correlated with age increase and this finding was statistically significant (p=0.01). PEX was significantly higher in patients with matured cataracts (p<0.05). The mean IOP was significantly higher in eyes with PEX (23.3±3.5 mmHg) than eyes without PEX (14.3±4.2 mmHg) (p<0.05). Patients with IOP >21 mmHg and glaucoma were higher in the PEX group and statistically significant (p<0.05) (Table 2).

Discussion

Our study is the first study on PEX in Somalia. In this study, the frequency of PEX was 40.9% in patients preparing for cataract surgery. This finding was higher compared to other studies conducted in different populations. The prevalence of PEX was 10.7% (7) in Iceland, 16.4% (9) in Turkey, 22.1% (10) in India, 25.2% (11) in Finland, 27.9% (12) in Greece and 39.3% (6) in Ethiopia. To date, many researchers have reported significant differences in the prevalence of PEX in the same country or close geographic area (13,14). The reason for the large change in PEX prevalence in near and far populations is unclear. There have been studies (15) showing that exposure to ultraviolet radiation increases prevalence, but the high prevalence among Icelanders living near the North Pole does not support this hypothesis (16).

There was no significant difference in the gender distribution of PEX syndrome in our study, and this finding was similar to other studies in Japan (17), Australia (18) and Saudi Arabia (1). However, some research has indicated that it is more common in men and has linked this condition to men working more outdoors and being more exposed to ultraviolet radiation (19,20).

Our study included patients over the age of 50 with PEX findings. In a hospital-based study that investigated the frequency of PEX in patients preparing for cataract surgery, it was reported that PEX was not seen under the age of 50 (21). In addition, hard cataracts are more common over the age of 50 (21). In our study, PEX frequency was 12.9% in the 51-60 age group, 41.9% in the 61-70 age group, 59.5% in the 71-80 age group and 50% in the over 80 age group. The increase in PEX frequency relative to age was statistically significant (p<0.05).

PEX patients in our study were significantly older than non-PEX patients. This finding was similar to the results of earlier research (13,22). Compared to study results from other regions, PEX appears to occur at a relatively younger age in Africans (4). However, the average age of the patients with PEX was similar to the European average (23). One of the

reasons that the age of the patients in our study was higher than in other studies in Africa is that Somali patients were often admitted to hospital for cataract surgery when their vision level was too low to do daily work. The most common type of cataract in our PEX patients was hypermature cataract (55.5%), while in non-PEX patients (41.5%), cortical cataract was the most common type. The proportion of mature and hypermature cataracts (49.1%) was high due to late application. The increase in PEX rate was statistically significant as cataract stiffness increased (p<0.05).

Although the relationship between PEX and cataract is not fully explained, some theories have been presented. The most widely accepted theory is that hypoxia, oxidative stress, ocular ischemia developing as a result of increased growth factor levels in aqueous fluid due to deterioration of the blood-aqueous fluid barrier and that this condition contributes simultaneously to the development of PEX and cataract (24).

Today, the relationship between PEX and glaucoma is well known. The prevalence of glaucoma in PEX patients was 13.3% (6) in Ethiopia, 19% (25) in South Africa, 28.8% (26) in Greece, 32.1% (9) in Turkey and 71% in our study. The most important reason for this high rate in our study is that our institution is the only tertiary Hospital in the country and that patients with complicated cataracts that cannot be done in other centers are referred to our hospital.

Additionally, the average IOP was higher in PEX patients than in the non-PEX group, which was consistent with previous studies (2,13,26) and statistically significant (p<0.05). Based on these findings, the presence of PEX can be considered one of the main risk factors in the development of glaucoma.

The limitation of our study was that it was a hospital-based study and that the prevalence of PEX was assessed only in the population with cataracts. Therefore, the results of the study may not reflect the actual distribution of PEX in the Somali general population. Prospective community-based studies are needed to determine the optimal frequency of PEX in this area.

Conclusion

Our study confirms that PEX is a common condition in the Somali public. In our study, PEX was associated with aging, matured and hypermature type cataracts, glaucoma and increased IOP.

Table 2. Characteristics of Pseudoexfoliation syndrome and non-Pseudoexfoliation syndrome eyes (number of patients =110)

	PEX				Total	%	p
	Yes	%	No	%			
Cortical cataract	3	(10)	27	(90)	30	(27.3)	<0.05
Nuclear cataract	4	(84.6)	22	(15.4)	26	(23.6)	
Mature cataract	13	(56.5)	10	(43.5)	23	(20.9)	
Hypermature cataract	25	(80.6)	6	(19.4)	31	(28.2)	
IOP (mmHg)	23.3±3.5	-	14.3±4.2	-	18±5.9	-	<0.05
Glaucoma (+)	32	(71.1)	7	(89.2)	39	(35.5)	<0.05
Glaucoma (-)	13	(28.9)	58	(10.8)	71	(64.5)	

PEX: Pseudoexfoliation syndrome, IOP: intraocular pressure

Ethics

Ethics Committee Approval: This hospital-based prospective study was conducted according to the principles of the Declaration of Helsinki and received the approval of the Ethics Committee of the Recep Tayyip Erdoğan Training and Research Hospital of Somalia Mogadishu Turkey (decision no: 172, date: 25.11.2019).

Informed Consent: Written informed consent was obtained from the patients and their families before any examination or treatment was performed.

Peer-review: Externally peer-reviewed.

Financial Disclosure: The author declared that this study received no financial support.

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