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Original Article

Consequences of Phacoemulsification Surgery in Libyan Patients with Pseudoexfoliation Syndrome

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ABSTRACT

Objective. The aim of this study was to evaluate the demographic characteristics and rate of intraoperative complications of phacoemulsification in patients with pseudoexfoliation syndrome (PEX). **Methods**. A retrospective comparative study of a total of 193 patients, schedules for phacoemulsification in the martyr Sohail Al Atrash eye hospital-Benghazi were included. Demographic parameters like age and sex as well as clinical features including the presence of PEX and intraoperative surgical complications were collected, analyzed and compared to control group without PEX. **Results**. A total of 193 consecutive patients (89 males and 104 females) aged 40-90 years were included in this study. The mean age was (68.3± 6.5) in the PEX group and (63.1±8.4) in the control group. It was significantly higher in the PEX group compared to controls (P=0.005), with no significant gender differences. Approximately, 193 of these patients (23 with PEX, 170 without PEX as the control group) that underwent phacoemulsification cataract extraction with intraocular lens implantation. There was no statistically significant difference in intraoperative complications between PEX and non-PEX groups. Posterior capsule rupture occurred in 4.3% in PEX and 5.3% in non-PEX, vitreous loss was not presented in PEX compared to 1.8% occurred in non-PEX, dropped nucleus occurred in 4.3% in PEX and 0.6% in non-PEX. **Conclusion**. Phacoemulsification can be safely performed by experienced hands in cataractous eyes with PEX.

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INTRODUCTION

Pseudoexfoliation is an age-related basement membrane degeneration characterized by deposition of elastin-like granular or fibrillar dandruff material on ocular structures such as corneal endothelium, iris, lens anterior capsule, zonules, vitreous anterior, conjunctiva, and blood vessels. It is a systematic condition affecting other organs like myocardium, kidneys, gallbladder and dura, but ocular manifestations are most evident and have many complications. Glaucoma, an intraoperative post-capsule rupture and vitreous loss during cataract surgery are the most common ocular complication due to PEX [1].

It was first described by the Finnish ophthalmologist John Lindberg in his doctoral thesis in 1917 [2]. Exfoliation syndrome, also known as

pseudoexfoliation syndrome, is a systemic condition that is usually identified in individuals over 50 years of age. It characterized by the production and progressive accumulation of fibrillary material in tissues throughout the anterior segment and in the connective tissue of various visceral organs. These deposits distinguish exfoliation syndrome from true exfoliation, which is the splitting of the lens capsule induced by infrared radiation [3].

Epidemiological studies indicated that the syndrome accounts for 20–25% of open-angle glaucoma, which is the world's most commonly known cause [4]. PXE induced iridopathy and zonular instability make regular cataract surgery a daunting task [5].

Scorolli et al. found that intraoperative complications of these patients are five times higher than normal average. This condition is therefore very necessary to identify before such patients starting surgery [6]. Surgical and postoperative complications often are multifactorial in nature and contribute directly to pathological changes in intra-ocular pseudoexfoliation material. Many cases may be undetected as the pupil does not dilate or failure to examine the lens surface before surgery with the slit lamp. Rational diagnostic, preventive and therapeutic methods should also be developed and used [6].

The current study aimed to evaluate the demographic characteristics and rate of intraoperative complications of phacoemulsification cataract surgery in patients with pseudoexfoliation syndrome (PEX) among Libyan patients attending the Martyr Sohail Al-Atrash eye hospital in Benghazi, Libya.

METHODS

A retrospective hospital-based case control study including a total of 193 patients, scheduled for cataract surgery (phacoemulsification by Alcon Accurus 800CS machine) in the Martyr Sohail Al-Atrash eye hospital, Benghazi from 1st Jan 2010 to 31 May 2010. Demographic parameters such as; age and gender, as well as clinical features including the presence of PEX and intra-operative surgical complications were collected, analyzed and compared to control group of patients without pseudoexfoliation.

All eyes underwent complete eye examination before the surgery and were evaluated for the signs of pseudoexfoliation material in the pupil, iris and lens capsule on dilated pupil with slit lamp were examination. The inclusion criteria included patients above the age of 40 years exhibited with age-related cataract, and scheduled for phacoemulsification cataract surgery without prior history of intraocular surgery in the examined eye. While, the exclusion criteria were cataract cases secondary to systemic diseases, uveitis, corneal opacity and trauma.

A total of 193 eyes (23 with PEX, 170 without PEX as the control group) that underwent phacoemulsification (PHACO) cataract surgery and intraocular lens (IOL) implantation at the martyr Sohail Al-Atrash eye hospital in Benghazi. All surgeries done by expert surgeons (>5 years' experience), adopting different surgical techniques. Surgical notes were evaluated, data were analyzed and compared to a control group without PEX.

Statistical Analysis

SPSS Statistics for Windows (Version 21.0. Armonk, NY: IBM Corp.) was used for statistical analysis. Comparison of categorical variables were done by using chi-square. Independent t-test used for mean comparison. *P* value less than 0.05 were accepted as statistically significant value.

RESULTS

Out of 193 patients enrolled, 23 were diagnosed with PEX. There were 10(11.2%) males and 13 (12.5%) females among the PEX cataract patients, and 79 (88.8%) male and 91 (87.5%) female controls. The prevalence of pseudoexfoliation was dissimilar in women (12.5%) and men (11.2%) (P>0.05). There was statistically insignificant effect of gender on pseudoexfoliation frequency (Fig 1).

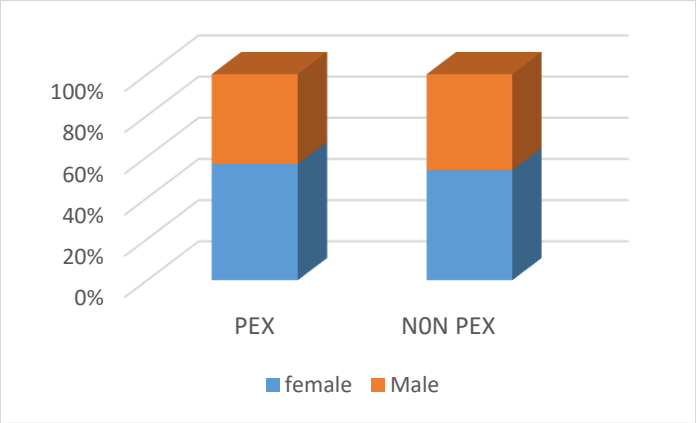

Figure 1: Gender distribution in study groups

The mean age of participants was 68.3± 6.5 in the PEX group and 63.1±8.4 in the control group, and it was significantly higher in the PEX group compared to controls (P=0.005). Intraoperative posterior capsule rupture (PCR) occurred in 1(4.3%) PEX patients and 9(5.3%) controls (P>0.05, Table 1). The difference was also statistically insignificant.

Table 1: Relation between PEX and posterior capsule rupture

Posterior capsule rupture						
			(-)	(+)	Total	P
Pseudoexfoliation	(-)	Number	161	9	170	>0.05
		%	94.7%	5.3%	100%	
	(+)	Number	22	1	23	
		%	95.7%	4.3%	100%	

Intraoperative vitreous loss (VL) was not occurred in PEX patients in compare to its incidence of 3(1.8%) controls; the difference was statistically insignificant (p>0.05, Table 2).

Table 2: Relation between PEX and Vitreous loss

Vitreous loss						
			(-)	(+)	Total	P
Pseudoexfoliation	(-)	Number	167	3	170	>0.05
		%	98.2%	1.8%	100%	
	(+)	Number	23	0	23	
		%	100%	0	100%	

Dropped nucleus (DN) occurred in 1(4.3%) PEX patients and 1(0.6%) control, the difference was statistically insignificant (P>0.05, Table 3). Figure no. 2 illustrate all intraoperative complications in both groups.

Table 3: Comparison of PEX and dropped nucleus

Dropped nucleus						
			(-)	(+)	Total	P
Pseudoexfoliation	(-)	Number	169	1	170	>0.05
		%	99.4%	0.6%	100%	
	(+)	Number	22	1	23	
		%	95.7%	4.3%	100%	

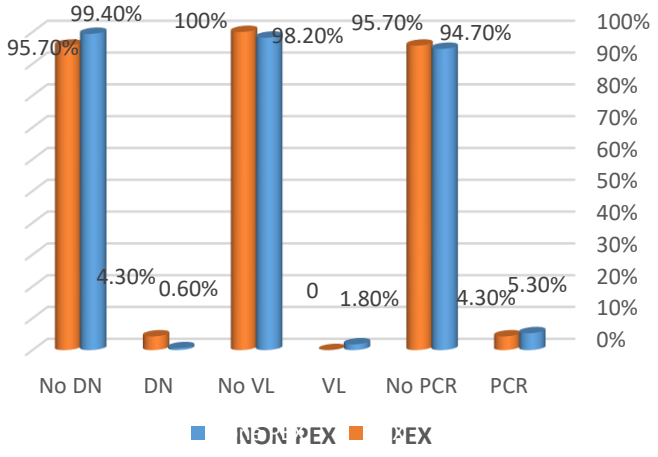

Figure 2: Relation between PEX and intra-operative complication

DISSCUSION

In 1917 Lindberg identified Pseudoexfoliation syndrome for the first time. Some studies documented variations in the eyes with and without PEX. The present study was aimed at documenting this disparity in Eastern Libyan patients in term of PEX syndrome. The prevalence of PEX is well known to increase with age [7]. The current findings showed that the mean age of subjects with PEX syndrome was 5.2 years older than the normal population.

The PEX Group's mean age was considerably higher than the non-PEX group. This was demonstrated also with reports estimating the prevalence of PEX in a similar population like ours, patients scheduled for cataract surgery [8]. A similar result was reported in several other studies in Ethiopia and Saudi Arabia [9,10]. In certain instances of exfoliation syndrome, women have predominated with a previous reported ratio of 1:1,27 between men and women of PEX patients in India [11] The occurrence of PEX in China was rare at 0.4 %in males without females [12]. In Nepal, there was 4 times higher prevalence of PEX in males than in females [13]. Although the exact cause of higher PEX prevalence in males was not clear, it may due to men's longer exposure to provoking climatic conditions [10].

Earlier report of PEX among Saudi population detected a prevalence of 3.5%, without a significant difference between the frequency of male and female [10]. The gender distribution of our sample in the normal population was comparable without preference to either gender, also in comparison with other reports, although some studies indicated a preponderance for female [14].

Differences in surgical outcomes among eyes with and without PEX during cataract surgery were recorded by several studies. In the Indian eyes with PEX syndrome, Shastri and Vasavada found phacoemulsification safe [15]. The rate of intraoperative complications between the PEX group and the control group in our study was insignificantly difference.

It is well understood that PEX cataract procedure is associated with increased complication during the operation. Poor dilatation of the pupils is one of the most frequent issues in cataract surgery with PEX. Cataract surgery on PEX syndrome eyes is known to be a challenge, as zonules are weak and pupil dilatation is poor [16]. Initial case reports record an increased rate of complications in patients with PEX syndrome during cataract extraction. A frequency of 9.6 % capsular tear, zone tear or vitreous loss in eyes with PEX is observed in Drolsum and co-authors [17]. The vitreous loss rates for the PEX eyes 4% and 0% for a non-PEX group were documented by Shingleton and co-authors [18].

Pandey et al. reported a significantly higher posterior capsule rupture in the PEX group when compared to the non-PEX (capsule rupture occurred in 12.5% of PEX patients and 3.4% of the patients without PEX) Vitreous loss was not statistically significant (8.8% of the patients in PEX group and 3.4% of non-PEX group [19].

Studies conducted by Shastri and Vasavada [15], Michael Hyams et al. [20], and others, however, report no significant difference in the frequency of complications among PEX and non-PEX patients. In Nagashima RJ. study no cases of posterior capsular tears and zonulo-dialysis were reported [21].

Other studies carried out in cataract surgery by skilled surgeons who have observed the risk of PEX complications have shown a lower rate than earlier studies that showed a 10-fold rise [20,22]. While intra-operative complications between the two groups were comparable in our study (figure 2), no significant difference was found between the two groups. Our findings may not be identical to those in other studies, as we have not performed PHACO in the eyes with severe phacodenesis and subluxated lenses. Surgical experience is a crucial factor in the rate of intraoperative complications.

CONCLUSION

Phacoemulsification can be safely performed by experienced surgeons in cataractous eyes with PEX. The rate of intraoperative complications in eyes with PEX was not significantly different compared to eyes without PEX. This study highlights the fact that phacoemulsification is safe to perform with pseudoexfoliation cases by experienced surgeons. Careful diagnosis and detecting of PEX in cataract patients may help to prevent possible surgical complications. Further prospective a single surgeon, larger population studies are required to confirm the result of our study.

Limitation

One important limitation raised in this study is that pupil dilatation is not noticed pre- and intra-operative. However, the findings of this study hopefully provide valuable results and recommendations for future studies, despite these limitations.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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