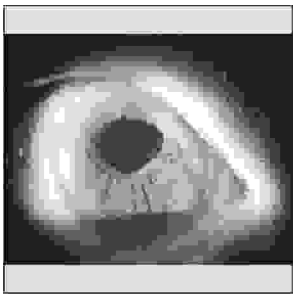
ORIGINAL PROF-974

CATARACT SURGERY;
INTRAOCULAR PRESSURE IN NON-GLAUCOMATOUS EYES WITH PSEUDO EXFOLIATION SYNDROME



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ABSTRACT ... Objective: To investigate the course of intraocular pressure after cataract surgery in patients having pseudo exfoliation syndrome but without any evidence of glaucoma. **Design:** Prospective age-matched comparative type. **Place and Duration of Study:** Department of Ophthalmology, Combined Military Hospital, Peshawar and Military Hospital, Rawalpindi. From 1st November 2003 to 30th April 2004. **Patients and Methods:** Ninety five patients having cataract, were divided into two groups. Group I consisted of forty five patients with pseudo exfoliation syndrome and Group II comprised control group of fifty patients not having pseudo exfoliation. All the patients underwent extra-capsular cataract extraction with posterior chamber intraocular lens implantation. The intra- ocular pressure was measured pre-operatively as well as on 7th post-operative day, 1st and 3rd post-operative months, in addition to other pre- and post-operative evaluation. **Results:** Statistically, there was no significant difference in the pre-operative intraocular pressure between the two study groups. At 7th post-operative day, the intraocular pressure was below 18 mm of Hg in all the patients. First and 3rd month after the surgery, a decrease in intraocular pressure was observed. The inter-group differences in intraocular pressures at 1st and 3rd post-operative months were statistically not significant. **Conclusion:** Seven days after extra-capsular cataract extraction with posterior chamber intraocular lens implantation, no increase in intraocular pressure was observed in the eyes with pseudo exfoliation syndrome. Three months after cataract surgery, intraocular pressure levels decreased in eyes with pseudo exfoliation syndrome similarly as in control group.

Key words: Pseudo exfoliation syndrome; Cataract surgery; Extra- capsular cataract extraction; Intraocular pressure.

INTRODUCTION

Pseudo exfoliation syndrome is a relatively common but easily overlooked cause of chronic open angle glaucoma. When an eye with Pseudo exfoliation develops secondary trabecular block glaucoma, it is called Pseudo exfoliation glaucoma or glaucoma capsulare[1]. Pseudo exfoliation is now suspected to be an ocular manifestation of a systemic disorder. It is associated with

a greater risk of operative complications[2].

Pseudo exfoliation syndrome is age-related, familial condition and seems to be genetically inherited[3]. The origin and composition of the deposited material is not entirely clear. In Pseudo exfoliation, a grey-white, fibrogranular material is deposited in and around the anterior segment of the eye [4]. Making a diagnosis often requires a careful slit-lamp examination and it frequently goes undiagnosed, leading to unexpected problems in the management. Similar material has been detected in skin and connective tissue portions of various visceral organs[5, 6].

The Intraocular Pressure (IOP) has been particularly investigated during various work-ups on this condition [7]. Pseudo exfoliation syndrome has recently been recognized as one of the most common identifiable cause of glaucoma, and accounts for the majority of the glaucoma in some areas[8]. Several possible mechanisms accounting for the impaired dynamics of the anterior chamber pathways have been suggested, the most popular being a trabecular dysfunction with impairment of aqueous humor outflow. There have been evidences that accumulation of fibrillar material and pigment granules in the intertrabecular spaces can result in the obstruction of meshwork system [9].

Pseudo exfoliation syndrome has been reported with increasing frequency in Pakistan as well[10]. The influence of cataract surgery on the IOP is important, and has been studied extensively in normal and glaucomatous eyes. Pressure changes have been found in the immediate post-operative period as well as persistently after surgery[11]. Eyes with compromised aqueous outflow, as in Pseudo exfoliation syndrome, are threatened with developing defective aqueous dynamics postoperatively. Therefore, we conducted this study with an aim to focus on the effect of cataract surgery on IOP when normotensive eyes with and without Pseudo exfoliation syndrome undergo surgery. To further increase the yield of the study, we took a control group of otherwise normal individuals to compare the effects of extracapsular cataract extraction (ECCE) with posterior chamber intraocular lens (PC IOL) implantation.

PATIENTS AND METHODS

A prospective, age-matched, comparative study was conducted from 1st November 2003 to 30th April 2004 in Eye Department, Combined Military Hospital, Peshawar and Military Hospital, Rawalpindi, both of which are tertiary care teaching hospitals.

The objective of the study was to determine the course of IOP after cataract extraction with implantation of IOL in non-glaucomatous eyes with Pseudo exfoliation syndrome.

Non-probability convenient sampling of first 95 patients with age related cataract reporting in eye OPD for ECCE with IOL implantation was done who met the inclusion criteria. They were divided into two groups. For Group I, the following inclusion criteria were considered: All the patients having pseudoexfoliative material on any of the anterior chamber structure, normal preoperative IOP (11mm of Hg to 21mm of Hg), nuclear or subcapsular cataract, normal optic disc and patients with ages between 50-80 years. For Group II, patients met all the criteria as for Group I but with the absence of Pseudo exfoliation. Conditions excluded from the study were: Evidence of angle closure, glaucoma, hypermature cataract, subluxated lens or evidence of phacodonesis, high myopia, clinically significant trauma to the eye, history or evidence of intraocular inflammation, previous ocular surgery, diabetes mellitus and uncontrolled hypertension.

A comprehensive proforma, including informed consent, was devised to register the patient's particulars. The group assignment was indicated in the proforma and required recordings of IOP were endorsed for each patient. Goldmann applanation tonometer was used for measurement of IOP.

A separate data collection proforma was filled for every patient. A detailed slit-lamp examination was done in each patient to look for any signs of intraocular inflammation or evidence of previous surgery. Gonioscopy was carried out before dilating the pupils to looks of any evidence of angle closure and peripheral anterior synechia. The pupil was then dilated and thorough anterior and posterior segment examination

(where possible because of less hazy media) was performed to rule out any other intraocular pathology. Patients with diabetes mellitus and hypertension were not included in the study.Eighty two patients were found eligible for final analysis because 5 patients from Group I and 8 patients from Group II were excluded due to loss of follow up at various stages of the study.

Preoperatively, intraocular pressure was checked one day before surgery. No IOP lowering medicines were used. Before surgery, the pupil was dilated with 1% tropicamide (Mydriacyl Alcon) eye drops. Peribulbar injection of Lignocaine 2% and Adrenaline 0.0005% (Xylocaine Barrett Hodgson) were given for local anaesthesia. All the patients underwent ECCE with PC IOL After disinfecting and draping the eye, eye speculum was applied. A 7-12 mm half thickness limbal incision was made. Anterior capsulotomy was done using 26 gauge bent needle and capsulorrhexis forceps was used where required. Using corneal scissors, the incision was made full thickness. Hydrodissection was done, using balanced salt solution (BSS Alcon). Expression of nucleus of crystalline lens was performed with application of pressure and counter-pressure on cornea at 6 O'clock and on sclera at 12 O' clock position respectively. Cortical lens matter was washed with BSS using two-way irrigation-aspiration cannula. AC and capsular bag were filled with 2% Hydroxypropyl methylcellulose (HPMC). The posterior chamber polymethylmethacrylate (PMMA) single-piece rigid IOL (Rayner) whose optics was 6.4 mm in diameter was implanted into the capsular bag. Wound was closed with 10/0 nylon suture. The HPMC was thoroughly aspirated from the anterior segment using irrigation aspiration cannula with BSS. At the conclusion of the operation, the tonus of the eye was restored to approximate physiological levels with BSS.

A subconjunctival injection of 0.5ml Gentamicin (Nicholas) (40mg/ml) and 0.5 ml Dexamethasone (MSD) (4mg/ml) was given. Eye was padded after instilling 0.5% chloramphenicol (Econochlor Alcon), 0.3% Tobramycin (Tobrax Alcon) and 1% Prednisolone (Fortipred Remington) eye drops and 1% chloramphenicol eye ointment (Neo-phenicol PDH).

All patients were seen on the next day of surgery. Postoperatively, following medicines were advised: Prednisynth eye drops (0.2% Chloramphenicol + 0.5% Prednisolone Schazoo) four times a day starting the day after surgery and continuing for one month, and Neo-phenicol eye ointment before sleeping for two months. Tablet Mefenamic acid (Ponstan 250mg Parke-Devis) two tablets thrice daily and capsule Cloxacillin (Orbenin 250mg SmithKline Beecham) two capsules four times a day were also advised for five days.

All the patients were seen on 7th post-op day, first and 3rd post-op month and IOP was recorded by the same ophthalmologist in addition to visual acuity and slit lamp anterior segment examination and relevant findings were noted on the given proforma.

Statistical Package for Social Sciences version 11.0 (SPSS 11) was used to analyze the findings. A p value < 0.05 was used as significant cut off point.

RESULTS

Eighty two patients were eligible for final analysis. Out of these, 40 were in Group I and 42 were in Group II. In Group I, 25 were males and 15 were females. In Group II, 27 were males and 15 were females. Age spectrum was from 52 years to 80 years (mean 66.08± SD 5.89 years) in Group I and from 54 years to 79 years (mean67.26± SD6.75 years) in Group II. The age difference between the two groups was not statistically significant (p=0.248). Twenty eight (70%) patients in first group had bilateral Pseudo exfoliation.

Table-I. Pre operative IOP

	Mean IOP (mm of Hg)±SD(Range of IOP)		P Value
Time	Group I(n=40)	Group II(n=42)	
Preoperative measurements	15.55±1.65	15.42±1.48	0.842

SD=Standard deviation

Measurements of IOP taken at various stages of the study are given in Table I-V. These measurements showed that there was no significant 'between the

groups' difference in pre-operative IOP. No patient in either group had a preoperative IOP greater than 19 mm of Hg (Table-I).

Table-II. Preoperative and 7th postoperative day IOP results

Group	Time		P value
	Preoperative IOP ± SD mm of Hg	7th Postoperative day IOP ± SD mm of Hg	
Group I(n=40)	15.55±1.65	15.50±1.36	0.772
Group II(n=42)	15.42±1.48	15.45±1.58	0.893

Table-III. Preoperative and Ist postoperative month IOP results

Group	Time		P value
	Preoperative IOP ± SD mm of Hg	Ist Postoperative month IOP ± SD mm of Hg	
Group I(n=40)	15.55±1.65	14.25±1.26	<0.05
Group II(n=42)	15.42±1.48	14.14±1.54	<0.05

Table-IV. Preoperative and 3rd postoperative month IOP results

Group	Time		P value
	Preoperative IOP ± SD mm of Hg	3rd Postoperative month IOP ± SD mm of Hg	
Group I(n=40)	15.55±1.65	13.77±1.25	<0.05
Group II(n=42)	15.42±1.48	13.88±1.31	<0.05

At 7th post-op day, IOP was below 18 mm of Hg in both the groups. Both the groups had no statistically significant difference. (Table II). On the visit at 1st post-operative month, mean IOP in both the groups was lower than the mean pre-operative IOP.

Table-V. IOP Comparison between the two groups at various stages of study

Time	Mean IOP±SD (mm of Hg)		P value
	Pseudo exfoliation Group	Control Group	
Preoperative	15.55±1.65	15.42±1.48	0.842
7th Postoperative day	15.50±1.36	15.45±1.58	0.950
Ist Postoperative month	14.25±1.26	14.14±1.54	0.780
3rd Postoperative month	13.77±1.25	13.88±1.31	0.709

The net change in mean IOP was statistically significant as compared to mean preoperative IOP in both the groups (Table III). Moreover, the mean IOP values at 1st post-operative month were comparable between the two groups (p= 0.780). None of the patients had IOP greater than 17 mm of Hg. On the last visit at third post-operative month, the mean IOP change was statistically significant when compared to mean pre-operative IOP (Table IV). The mean IOP levels at 3rd post-op month were comparable between the two groups (Table V).

DISCUSSION

Pseudo exfoliation syndrome is known to be associated with IOP abnormalities in the affected eyes[7]. Since aqueous dynamics can be deranged in both Pseudo exfoliation syndrome and glaucoma, the IOP status was considered separately here in this study. So serial applanation tonometer readings were performed before and after ECCE with PC IOL implantation in patients having Pseudo exfoliation syndrome and these readings were compared with age-matched control group of patients.

We observed no significant change in IOP at 7th post-operative day followed by a progressive decline in IOP at 1st and 3rd post-operative months. There was no significant inter-group IOP difference at any stage during the study. However, the fall in IOP at 1st and 3rd post-operative month were statistically significant in both the

groups when compared to preoperative IOP measurements. This pressure reduction seems to be attributable to the surgery[12].

One previous study reported a statistically significant decrease in IOP two years after phacoemulsification in the Pseudo exfoliation syndrome (2.9 mm of Hg) as well as in non-Pseudo exfoliation syndrome patients (1.9 mm of Hg)[13]. These results are comparable to our study. Merkur and co-authors evaluated the course of IOP after phacoemulsification with PC IOL implantation in patients with Pseudo exfoliation syndrome[14]. They reported that patients with Pseudo exfoliation syndrome had a postoperative IOP reduction from baseline at all measurements and a significantly greater reduction in IOP than patients in the POAG and cataract control groups at 6 and 12 months.

In another study, no increase in IOP was observed at 1st post-operative day in eyes with Pseudo exfoliation syndrome after scleral tunnel incision and phacoemulsification[15]. In this study, the IOP decreased in the presence of Pseudo exfoliation similarly as in eyes without Pseudo exfoliation.

Naseem and co-workers found a gradual decrease in IOP measured at 1st, 10th, 30th and 60th postoperative day[16]. These results appear quite similar to our study. However, this study differs from our study in that there was no control group and five had IOP higher than 21 mm of Hg and eight had IOP lower than 11 mm of Hg preoperatively (our cut off point for inclusion criteria).

In India, a generalized study conducted to evaluate the intraoperative and postoperative behavior after phacoemulsification in Indian eyes with Pseudo exfoliation, the change in IOP measured at first day and first postoperative month were comparable between the Pseudo exfoliation syndrome group and the control group[17].

It has been suggested that the deposits of pseudoexfoliative material regress after cataract extraction and there appears to be an improvement in trabecular function[18]. We observed similar responses in both Pseudo exfoliation and the control groups, thereby suggesting that the pressure-lowering mechanism might well be similar.

The requirement for use of pressure reducing agent in routine has been proposed by some authors[19]. However, this need could not be confirmed in our study.

CONCLUSIONS

In our study, presence of Pseudo exfoliation did not cause any complications. Our results suggested that there was no significant increase in post-operative IOP after cataract extraction in the presence of Pseudo exfoliation syndrome. Rather in our study, ECCE with PC IOL implantation resulted in a significant decrease in IOP in patients with Pseudo exfoliation syndrome without glaucoma similar to that in eyes without Pseudo exfoliation syndrome.

It is probably safe to conclude that extraction of thickened cataractous lens with IOL implantation causes a significant decrease in intra-ocular pressure probably by improving the outflow facility and this decrease in the IOP seems similar to that in normal eye.

We suggest that study done specifically regarding the effect of cataract surgery on IOP in patients with Pseudo exfoliation syndrome involving a larger population group with a longer follow up is required.

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