

IMPACT OF AGE, GENDER, PRE-OPERATIVE INTRA OCULAR PRESSURE AND ANTERIOR CHAMBER DEPTH ON THE OUTCOME OF PHACOEMULSIFICATION PROCEDURE IN PSEUDO-EXFOLIATION SYNDROME

Nikhilesh Wairagade¹, Vikas Mahatme², Pramod Chipure³, Chitra Pande⁴, Rajesh Singare⁵, M. D. pawar⁶

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ABSTRACT: This was a prospective non comparative study conducted at Mahatme Eye Bank Eye Hospital, Nagpur, India. 175 eyes with Pseudo-exfoliation syndrome (PXF) undergoing cataract surgery by phacoemulsification were studied. The study aimed at finding out impact of age, gender, pre-operative Intra Ocular Pressure (IOP) and Anterior Chamber Depth (ACD) on the intraoperative complications of phacoemulsification surgery in these patients. It was found that association of age, gender and intraoperative complications was not significant (P value – 0.0958). No significant impact of preoperative intraocular pressure and intraoperative complications was noted. The mean anterior chamber depth in complicated cases was 2.42 +/- 0.37 as compared to 2.72 +/- 0.43 in eyes without complications. The relation between these groups was statistically significant (P value = 0.031).

KEYWORDS: Pseudo-exfoliation syndrome (PXF), Phacoemulsification, cataract surgery, intraocular pressure (IOP), Anterior chamber depth (ACD), intraoperative complications of cataract surgery, PCR (Posterior Capsular Rupture).

INTRODUCTION: Pseudo-exfoliation (PXF) first described by Lindberg¹ in 1917 and later on by Alfred Vogt² in 1918 means accumulation of grey white fibrogranular extracellular pseudo-exfoliative material produced by abnormal basement membrane of ageing epithelial cells in trabeculum, equatorial lens capsule, pupillary margin of iris and ciliary body of the eye.³ it may be an ocular manifestation of a systemic disorder. A study carried out in South India reported prevalence of PXF as 3.8% and 3.01%^{4,5}

PXF induced iridopathy and phacopathy with zonular instability make routine cataract surgery a challenging task. Scorolli et al⁶ (1998) found that there is 5 times greater risk of intraoperative complications in cataract surgery in such patients as compared with normal cases. This study aimed at finding out association if any between age of the patient, gender, pre-operative Intra Ocular Pressure and Anterior Chamber Depth and the outcome of Phacoemulsification procedure in Pseudo-exfoliation syndrome.

MATERIALS AND METHODS: The prospective hospital based non-comparative study was conducted in Mahatme Eye Bank Eye Hospital, Nagpur, India from November 2012 to April 2014. Study protocol was approved by institute's ethical committee. 175 patients with pseudo-exfoliation syndrome undergoing cataract surgery were studied.

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Inclusion Criteria: All eyes having slit lamp biomicroscopic picture of pseudo-exfoliation syndrome and undergoing cataract surgery by phacoemulsification.

Exclusion Criteria:

1. Previous Ocular trauma.
2. Hyper mature cataract.
3. Previous intraocular surgery.
4. Uveitis.
5. Manifest luxation or extensive subluxation of the lens visible preoperatively at Slit lamp examination.
6. Cataract extraction combined with additional intraocular surgical procedures (pars plana vitrectomy, trabeculectomy, keratoplasty).

Methodology included detailed preoperative history (With a special focus on use of anti-glaucoma medications if any), written informed consent, measurement of Intra Ocular Pressure (IOP) using Goldmann applanation tonometer, measurement of Anterior chamber depth (ACD) by A-scan biometry making use of the single machine and slit lamp bio-microscopy after pupillary dilation in order to diagnose pseudo-exfoliation syndrome clinically (Figure 1).

The other preoperative workup required for cataract surgery by phacoemulsification included measurement of Blood pressure, random Blood sugar, K-reading, calculation of IOL power, pre-anesthetic checkup. A standard Phacoemulsification surgery was performed by experienced surgeon making use of same kind of microscope and PHACO machine.

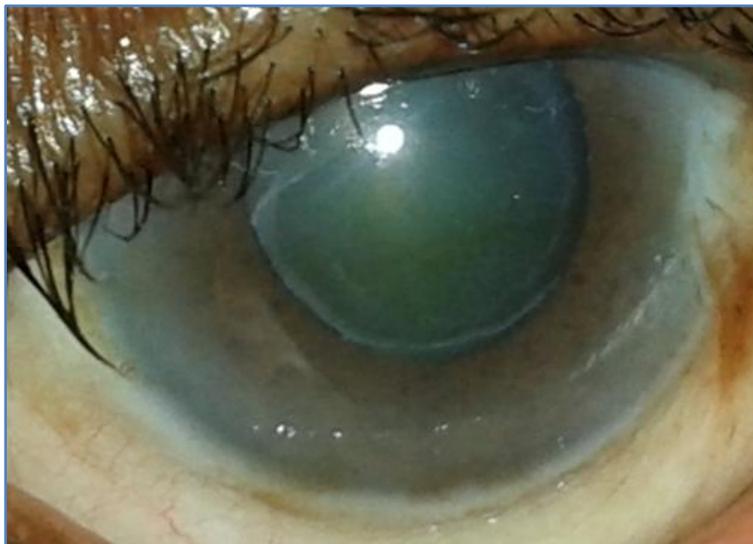


Fig. 1: Photograph of pseudoexfoliation material on lens capsule

OBSERVATIONS: 175 patients attending the hospital were examined according to study proforma and cataract surgeries were performed by phacoemulsification. Table 1 shows distribution of patients as per age and sex.

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Age (years)	Male		Female		Total	
	n=80	%	n=95	%	n=175	%
51-60	12	15.00%	19	20.00%	31	17.71%
61-70	50	62.50%	47	49.47%	97	55.43%
71-80	14	17.50%	25	26.32%	39	22.29%
>80	04	05.00%	04	04.21%	08	04.57%
Total	80	100%	95	100%	175	100%

Table 1: Distribution of subjects according to age and sex

Among 175 eyes, 97 (55.43%) of the patients were in age group of 61-70 years.

Figure 1 shows the complications occurred during cataract surgery by phacoemulsification. A total of 15 (08.56%) complications occurred among all eyes going for cataract surgery. The major complications were PCR with Vitreous loss (5.71%) followed by Zonular dialysis (1.71%) and Iridodialysis (1.14%).

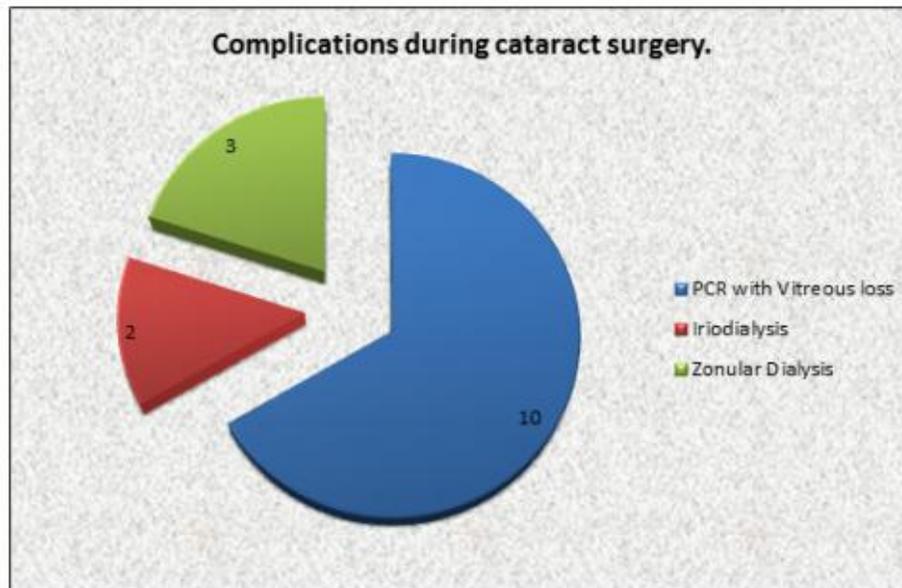


Figure 2: Complications during cataract surgery

The relation of age and complications is depicted in Table 2.

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Age (years)	Number	No. of complications	Percentage
51-60	31	1	3.22%
61-70	57	6	10.52%
71-80	80	7	8.75%
>80	7	1	14.28%
Total	175	15	8.57%

Table 2: Relation of age with intraoperative complication

Chi² for linear trend = 2.774 d.f.=2 P value=0.0958, Not Significant

The relation between age and complications was not statistically significant. Table 3 describes the relation of gender to the eyes with complications during cataract surgery among eyes of pseudoexfoliation syndrome patients. In study, 06(8.75%) males and 09 (8.57%) females were having complications. It was found that the association was not significant.

Sex	With complications (%)	Without complications (%)	Total (%)
Male	06 (8.75)	74 (91.25)	80 (45.71)
Female	09 (9.47)	86 (90.53)	95 (54.29)
Total	15 (8.57)	160 (91.43)	175 (100)

Table 3: Relation of sex with intraoperative complication

Chi² = 0.2159 d.f.=1 P value=0.642,(Not Significant)

The relation of IOP with complications during Surgery is shown in Figure 2.

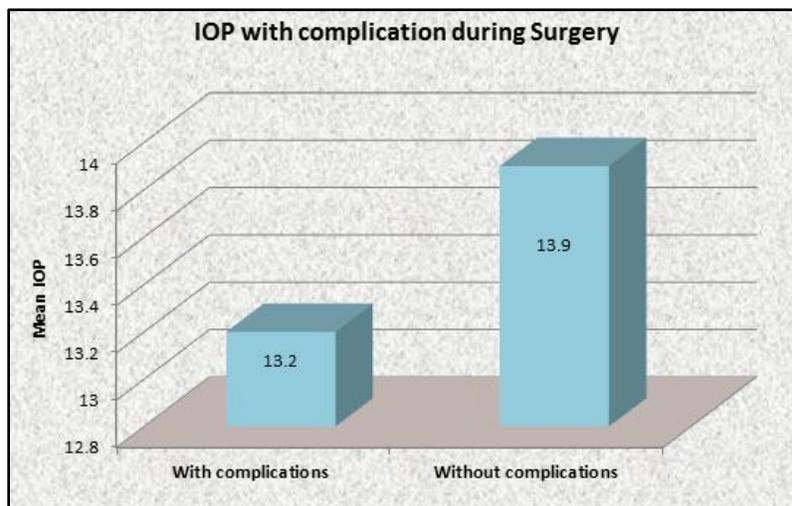


Figure 3: Relation of intraocular pressure and complications

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The mean IOP in eyes with complications was 13.2 ± 2.11 mm of Hg as compared to 13.9 ± 2.51 mm of Hg mean IOP in eyes without complications. It was found that the association was not significant.

Table 4 demonstrates the mean anterior chamber depth and its association with intraoperative complications.

ACD (mm)	With Complications	Without Complications	t value	P value
Mean \pm SD	2.42 ± 0.37	2.72 ± 0.43	2.5716	0.0110, Significant

Table 4: Relation of anterior chamber depth with intraoperative complications

T value=2.5716, P value=0.0110 (significant)

The mean anterior chamber depth in eyes with intraoperative complication was less 2.42 ± 0.37 mm as compared to 2.72 ± 0.43 mm in eyes without complications. Study shows that incidence of complication is more in eyes with small anterior chamber depth and association was statistically significant.

Table 5 shows association of preoperative factors independently with the intraoperative complications during phacoemulsification in eyes with PXF.

Parameter	Odds Ratio	95 % C.I.	P-value
Age (years)	1.07	0.98-1.17	0.109, NS
Sex (M/F)	0.82	0.24-2.77	0.752, NS
ACD (mm)	3.78	1.13-12.65	0.031, S
IOP (mm of Hg)	0.83	0.63-1.09	0.187, NS

Table 5: Multiple logistic regression analysis to identify the independent risk factors of intraoperative complication in pseudoexfoliation syndrome

(NS=Not significant, S=Significant)

Significant association was seen only between ACD with intraoperative complication with p value=0.031.

DISCUSSION: In our study of 175 patients; 97(55.43%) patients were between the age group of 61-70 years while 39 (22.29%) were in 71-80 years. Similar findings were seen in the Framingham Eye Study⁷ in US population. The prevalence increases with age, the disease most commonly manifesting between 60- 70 years.

In the present study a total of 15 (08.56%) complications occurred the major complications included Posterior Capsular Rupture (PCR) with Vitreous loss =10 (5.71%) followed by Zonular dialysis=03 (1.71 %) and Iridodialysis =02(1.14%), (Figure 1). Similarly, study conducted by Jawad Met al⁸ in eyes with pseudoexfoliation syndrome, there was vitreal prolapse in 10.5%, PCR in 9%, Iridodialysis in 1%, decentration of IOL in 4% and Zonular dialysis in 4% patients. In the study done

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by S. Bangal, et al.⁹ Intraoperative complications were PCR 6%, vitreous loss 4%, zonular dialysis 2% and iridodialysis 2%.

In our study we found that the association between age and incidence of complications was not significant. Table no 2. ($\text{Chi}^2=0.2159$, D.F. =1; P value =0.0958). A similar finding was seen in study conducted by M. Kuchle et al.¹⁰

The association between sex and incidence of intraoperative complications during cataract surgery was studied we found no statistically significant difference between the two groups. ($\text{Chi}^2= 0.2159$; P value=0.64) (Table no. 3). A similar finding was seen in study conducted by M. Kuchle et al¹⁰ and there was no statistically significant difference between the two groups in association with sex with (P value =0.87).

In the present study, relation of Intraocular Pressure with complications during Surgery was shown in figure 2. The mean IOP during surgery with intraoperative complications was 13.2 ± 2.11 mm of Hg as compared to 13.9 ± 2.51 mm of Hg mean IOP without complications. The values show no significant difference between the two groups. (P value=0.2984). Similar findings was seen in study conducted by Shingleton BJ¹¹ (2009). There was no statistically significant difference between the two groups in the mean intraocular pressure (mean decrease 2.6 mm Hg +/- 1.5 [SD] and 1.6 +/- 0.5 mm Hg, respectively) (P value =0.47).

In our study the mean anterior chamber depth in eyes with complication eyes was small (2.42 ± 0.37 mm) as compared to (2.72 ± 0.43 mm) in eyes without complications. The association between these groups was statistically significant. (P value=0.011) (Table no. 4). We found that incidence of intraoperative complication was more in eyes with small anterior chamber depth as compared to eyes with large anterior chamber depth. Similar findings were found in the study done by Kuchle et al¹⁰ (2000). The mean anterior chamber depth in eyes with complication was 2.36 ± 0.44 mm as compared to 2.74 ± 0.52 mm in eyes without complications. The relation between these groups was statistically significant. (P value=0.013). Other study done by Skuta G. L. et al¹² stated that pre-operative anterior chamber depth asymmetry increases the incidence of intraoperative complications.

In present study Multiple Logistic regression analysis was performed to identify the independent risk factors for incidence of intraoperative complication which describes the association of various preoperative factors to the intraoperative complications. It was shown that small anterior chamber depth was the only significant factor among eyes with pseudo-exfoliation syndrome operated for cataract surgery by phacoemulsification. The other factors like age, sex, intraocular pressure showed no statistical significance among intraoperative complications.

CONCLUSION: The present study showed that age, gender of the patient and preoperative IOP have no relation with intraoperative complications after Phacoemulsification in eyes having pseudo-exfoliation syndrome. However, there was statistically significant association between ACD (Anterior Chamber Depth) and intraoperative complications; lesser the ACD, more are the intraoperative complications.

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AUTHORS:

1. Nikhilesh Wairagade
2. Vikas Mahatme
3. Pramod Chipure
4. Chitra Pande
5. Rajesh Singare
6. M. D. pawar

PARTICULARS OF CONTRIBUTORS:

1. Senior Consultant, Department of Ophthalmology, Mahatme Eye Bank Hospital, Nagpur, India.
2. Founder Medical Director, Department of Ophthalmology, Mahatme Eye Bank Eye Hospital, Nagpur, India.
3. Senior Consultant, Department of Ophthalmology, Mahatme Eye Bank Eye Hospital, Nagpur, India.
4. Senior Consultant, Department of Ophthalmology, Mahatme Eye Bank Eye Hospital, Nagpur, India.

5. Professor and Senior Consultant, Department of Ophthalmology, Mahatme Eye Bank Eye Hospital, Nagpur, India.
6. Professor and Senior Consultant, Department of Ophthalmology, Mahatme Eye Bank Eye Hospital, Nagpur, India.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Nikhilesh Wairagade,
C/o Mahatme Eye Bank Eye Hospital,
16 Central Excise Colony, Ring Road,
Nagpur-440015, India.
E-mail: sm@mahatmehospital.com

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