A STUDY OF PERIOPERATIVE SURGICAL COMPLICATIONS IN EYES WITH PSEUDOEXFOLIATION UNDERGOING CATARACT SURGERY

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ABSTRACT

BACKGROUND

Pseudoexfoliation Syndrome (PES) is an age-related systemic microfibrilopathy, caused by progressive accumulation and gradual deposition of extracellular grey and white material over various tissues including eyes. Pseudoexfoliation (PXE) is a systemic condition which affects eyes in advanced ages in which period, cataract is also common. PXE poses various problems during cataract surgery like poor pupillary dilatation and zonular instability. We wanted to analyse perioperative complications in cataract surgery in presence of PXE.

MATERIALS AND METHODS

It was a prospective observational study conducted in a tertiary hospital from December 2016 to May 2018. 124 patients having cataract and PEX and who were above 50 years of age were included in the study. Cataract surgery was performed, and perioperative complications documented and statistically analysed.

RESULTS

Poor pupillary dilatation which occurred in 47.58% was the most common cause of surgical difficulty. Pupillotomy and other pupillary dilation devices were used. Other complications noted were subluxation of lens, rupture of posterior capsule, vitreous loss, retained lens matter, and dehiscence of zonules.

CONCLUSIONS

When cataract presents with PXE, there is an increased risk of surgical complications, the main being rigid pupil. Recognition of PXE preoperatively with proper examination and its management during surgery with various techniques and devices is essential to give a good vision to the patient.

KEY WORDS

Pseudoexfoliation, Zonular Weakness, Pupillotomy, Cataract

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BACKGROUND

Pseudoexfoliation syndrome (PES) is an age-related systemic microfibrilopathy, caused by progressive accumulation and gradual deposition of extracellular grey and white material over various tissues including eyes.

Lindberg, who first described Pseudoexfoliation (PXE) in 1917 believed this material to be a product of earlier inflammation.^[1] Swiss Ophthalmologist Alfred Vogt while describing it fully in 1918, thought it to be a remnant of papillary membrane.^[2] Now it is believed that the ageing epithelial cells in equatorial lens capsule, trabeculum, iris at pupillary margin, ciliary body produce extracellular pseudoexfoliative material which is grey white and fibrogranular in nature.^[3] Its presence in skin and visceral organs suggest that it is a systemic disorder.^[4]

A South Indian study reported prevalence of PXE as 3.8%, while the Andhra Pradesh Eye Disease Study reported it as 3.01%.^[5,6] PXE usually seen in the elderly age group and it is this same group of patients who will possibly undergo cataract surgery.

Pseudoexfoliative material (PXM) is seen deposited in three zones: in central pupillary area, peripheral pre-equatorial area and a central clear zone where the material has been brushed off by pupillary movements. The PXM can be observed like dandruff at pupillary margin. Iris sphincter gives moth eaten appearance on transillumination. Deposits can be observed on endothelial surface of cornea, gonioscopy shows PXM on trabecular meshwork with pigmentation, sometimes with a pigmented Sampaolesi line anterior to Schwalbes line.

PXM is fibrillar extracellular material consisting of a protein core surrounded by glycosaminoglycans produced by ageing epithelial cells of basement membranes of the iris, ciliary body and lens epithelium. It can also be produced by the basement membranes of endothelial cells of iris and conjunctival vessels and with trabecular endothelial cells.

Recent genetic studies in multiple populations have identified the lysyl oxidase-like 1 (LOXL1) gene as one of the major contributors to the risk of developing pseudoexfoliation syndrome and pseudoexfoliation glaucoma.^[7]

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Prevalence of PEX has been correlated with cardiovascular diseases such as transient ischaemic attacks, stroke, hypertension, angina, myocardial infarction and negatively with diabetes mellitus.^[8,9]

Presence of PEX makes cataract surgery challenging due to poor dilatation of pupil and zonular instability. Scorolli et al.^[10] found that the chances of intraoperative complications during cataract surgery are five times higher than that in normal population. In view of this it becomes imperative to detect presence of PEX preoperatively by dilating pupil and thorough examination.

This study was done with the aim of studying the pattern of intra-operative and post-operative complications during the cataract surgery in patients with PXE.

MATERIALS AND METHODS

It was a prospective observational study conducted in a tertiary hospital from December 2016 to May 2018 after obtaining ethical clearance of institutional ethical committee. 124 patients having cataract and PEX and who were above 50 years of age were included in the study. Those having complicated cataract, trauma and with previous surgery were excluded.

All patients were admitted on the previous day of surgery. Detailed examination of eye was done including visual acuity assessment, slit lamp examination gonioscopy, funduscopy and IOP measurement.

The presence of PEX material was confirmed by looking for white, fluffy, fibrillar or granular material at the pupillary margin or on the anterior lens surface after pupillary dilatation. Cataract type was classified as nuclear, cortical, posterior sub capsular (PSC), mature and mixed type based on slit lamp examination.

Pupillary diameter was measured after dilatation. A scan biometry, Keratometry and IOL power calculation was done. All the cases were operated by experienced surgeons either by Small Incision Cataract surgery (SICS) or by Phacoemulsification.

Pre-operatively Moxifloxacin eye drops were instilled from previous evening. Flurbiprofen drops were instilled three times in morning of surgery at half hourly interval. Pupil was dilated with tropicamide plus Phenylephrine drops and also 2% Homatropine drops.

Peribulbar anaesthesia with lignocaine, Bupivacaine and Hyaluronidase was given in all cases. Standard SICS was done and posterior chamber IOL with 6 mm optic implanted. In cases undergoing phacoemulsification clear corneal incision was used and foldable IOL implanted.

Post operatively patients were put on steroids and antibiotic drops which were tapered gradually over 6 weeks. Post-operative follow-up was done on post-operative day 1, day 7, day 14, then every two weeks for 3 months. Post-operative finding regarding inflammation, IOP, position of IOL and other findings were carefully noted and tabulated. Statistical analysis was done using statistical package for social sciences version 15.0 (IBM).

RESULTS

17.74% patients were in the age group of 50 – 60, 43.55 % patients were in the age group of 60 – 70 and 38.71 % patients were in the age group of 70 – 80. 52.42% patients were male, and 47.58% patients were female. Majority of

patients were in the age group of 60-70. Male patients were more in number than female patients in our study. [Table- 1]

7.26% of patients had preoperative visual acuity of 6/6 – 6/24, 13.71% had 6/36 – 6/60, 47.58% had counting fingers (CF), 19.36% had HM, and 12.09% had PL/PR. Majority of the patients had preoperative vision of CF. [Table-2]

Poor pupillary dilatation was found in 47.58% patients, Subluxation or dislocation of lens in 1.61%, Rupture of post capsule in 4.84%, Vitreous loss in 5.64%, Lens matter retained in 6.45%, IOL decentration in 4.03%, Dehiscence of Zonules 3.22%, and Post-operative Hyphema in 0.80%. [Table-3]

Post-operative Vision was mostly good. 6/6 – 6/12 vision was found in 54.84% patients, 6/18 – 6/36 in 37.90% and 6/60 or less in 7.26% patients. [Table-4]

Age	Male	Female	Total	Percentage
50 - 60	10	12	22	17.74
60 -70	29	25	54	43.55
70 - 80	26	22	48	38.71
Total	65	59	124	100

Table 1. Age-Sex Distribution

Vision	Number	Percentage
6/6 – 6/24	9	7.26
6/36 – 6/60	17	13.71
CF	59	47.58
HM	24	19.36
PL/PR	15	12.09
Total	124	100

Table 2. Pre-Op Vision

Sl. No.	Complications	No.	%
1.	Poor Papillary Dilatation	59	47.58
2.	Subluxation or Dislocation of Lens	2	1.61
3.	Rupture of Post Capsule	6	4.84
4.	Vitreous Loss	7	5.64
5.	Lens Matter Retained	8	6.45
6.	IOL Decentration	5	4.03
7.	Dehiscence of Zonules	4	3.22
8.	Post-Operative Hyphema	1	0.80

Table 3. Complications

Vision	Number	Percentage
6/6 – 6/12	68	54.84
6/18 – 6/36	47	37.90
6/60 or less	9	7.26

Table 4. Post-Operative Vision

DISCUSSION

PXE is generally found in old age, the same age group are generally posted for cataract surgery. It is always essential to examine all eyes meticulously before surgery both before dilatation and after dilatation, because PXE can be missed if pupils are not dilated. In certain situations where large number of surgeries are to be performed and if pupils are dilated only just before surgery then the surgeon may face unexpected difficulty per-operatively.

Maximum incidence of PXE in our study was found in 60-70 years age group which corresponds to other studies which also have shown increased prevalence after 60 years of age.^[11,12]

In our study a slight male preponderance was noticed. Studies about sex predilection in PXE are conflicting. Some studies reported male preponderance whereas Arvind et al. showed no sex predilection.^[5] Some other studies have shown female preponderance.^[13]

In our study the commonest problem encountered was poorly dilating pupil and was seen in 47.58% patients. Alfaiate et al.^[12] found prevalence of 48.4%. The commonest measure adopted by us was sphincterotomy. We also used iris hooks and pupillary stretching. We used dispersive-cohesive viscoelastic soft-shell technique^[14] which aided the pupillary dilatation and helped in maintaining it. Other workers have also used it for the same purpose.^[15]

Careful capsulorrhexis is required because ant capsule of lens may be fragile in PXE. Zonular weakness is a major problem during cataract surgery. One has to do proper capsulorrhexis, hydrodissection and nuclear rotation to avoid lens dislocation. Even there can be late dislocation of intraocular lens postoperatively.^[16] We found subluxation of lens during surgery in two cases. One of these cases was managed with capsular tension ring and the other was implanted anterior chamber lens.

We had rupture of posterior capsule and vitreous loss in 6 cases (4.84%) and one additional case of vitreous loss due to subluxation of lens. In literature vitreous loss has been reported in up to 11% cases.^[17,18]

In 8 cases (6.45%) some amount of lens matter was retained. It was mainly due to non-dilating pupil and vitreous loss. Two cases underwent post-operative anterior chamber wash and others were followed up without any further complication.

Two cases showed per-operative IOL decentration: one could be stabilized by dialling and in the other case the IOL was removed and AC IOL was implanted.

Three cases showed minimal post-operative IOL decentration which were compatible with satisfactory visual outcome. Literature mentions that decentration may be due to the entire capsular bag getting decentered.^[19,20]

Dehiscence of zonules was observed per-operatively in 4 cases (3.22%), they were noticed during nucleus rotation, during nucleus delivery and during cortical aspiration. Post-operative hyphema was seen in one case only.

Majority patients obtained good post-operative vision in our study.

Our study as well as all other studies which have been referred to in the above write-up have clearly demonstrated increased incidence of various complications in the presence of pseudoexfoliation. In view of this it is recommended that a proper evaluation of cataract patients should be done to avoid surprises. Examination with pupillary dilatation is mandatory. Once we know the presence of pseudoexfoliation then we should keep essential things ready such as: pupil expansion devices, Capsular support devices and cohesive as well as dispersive viscoelastics.

A careful post-operative followup is desirable. One should look for IOL decentration. There are increased chances of posterior capsular opacification for which poor pupillary dilatation and consequent retained lens matter may be one of the contributory factors.

CONCLUSIONS

When cataract presents with PXE, there is an increased risk of surgical complications, the main being rigid pupil. Recognition of PXE preoperatively with proper examination and its management during surgery with various techniques and devices is essential to give a good vision to the patient.

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