

Outcome of Cataract Surgery on Intraocular Pressure

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ABSTRACT

Objective: To determine the outcome of surgery of cataract on intraocular pressure.

Study Design: Observational Study.

Setting: Study carried out at Ophthalmology Department, Shaheed Mohtarma Benazir Bhutto Medical University Larkana, from 16-03-2020 to 15-09-2020.

Material & Method: Patients with cataract and plan for cataract surgery were randomly taken into two groups, calibrated applanation tonometry was used to assess pre and postoperative ocular pressure. IOP range between 12-40mmHg associated with cataract patients with selected following criteria from out patient department (OPD) with 40-86 years of age, either gender, healthy cornea, having been controlled for diabetes and hypertension.

Results: Age range of the patients was between 40 and 86 years, the overall mean \pm SD age of the patients was 58.48 ± 9.28 years. Our study observed that female 143 (52.6%) patients were more affected than male 129 (47.4%) patients (male to female ratio was 1:1.1). Preoperative intraocular pressure ranged from 12 to 40 mm Hg; overall mean \pm SD intraocular pressure was 18.81 ± 3.80 mmHg. While intraocular pressure checked within one week after surgery ranged from 8 to 26 mmHg, the overall mean \pm SD intraocular pressure was 12.41 ± 2.24 mmHg (p value < 0.001) (table no. 2). A significant decrease in intraocular pressure was 10.49 ± 1.020 mmHg observed at one month postoperative follow-up (p value < 0.001)

Conclusion: It is to be concluded that intraocular pressure decreases significantly after extraction of cataract and so the mild to moderate cataract can be treated through this as a first step in early glaucoma.

Keywords: IOP, Cataract extraction, Glaucoma.

INTRODUCTION

Extraction of cataract makes the huge volume of surgery in ophthalmology^{1,2}. Cataract surgery in modern times includes Viscoelastics considering it as a significant gadget. Many types of descriptive and cohesive viscoelastics with claim of dispensing utmost protection to endothelial cells are there in the market. Dr. Charles Kelman performed first Phacoemulsification in 1967, which is a key whole technique of extra capsular cataract extraction^{3,4}.

As reported in some recent studies the clear-cornea phacoemulsification can cause the decrease in IOP as low as normal (equivalent to control) in the patients with glaucoma developing cataract and needing the surgery for cataract⁵. Along with being helpful the limitations of these studies like all data being retrospective, taking only one baseline and follow up IOP readings, and inclusiveness of both the treated and untreated patients raise a lot of questions^{6,7}. In a cohort of hypertension with well-specified features, we established that the implantation of lens in cataract surgery decreases the IOP postoperatively to about 4.0 mmHg i.e about 16.5% decrease in the preoperative pressures with the maximum decrement shown by the group of patients with highest IOP, persisting by 1 year and declining by next 2 years postoperatively⁸. Bigger and Becker IN 1970'S reported a decrease in IOP after cataract surgery⁹. Yet, another recently published planned surgical systematic review in 2002 on RCT of patients having glaucoma and cataract together nullified the long term persistence of low IOP after cataract surgery. The variability of cataract surgery effect was different from one eye to another with decrement by 20% for 39.7% of the eyes and 0% to 20% on about half of the eyes (49.2%)¹⁰. The post cataract surgery out flow provision rises but the physiological grounds for lowered IOP stays hypothetical¹¹. The betterment in the role of trabecular meshwork is reported rather than the aqueous assess to meshwork because of no changing in the width of angle of open (normal) angle glaucoma patients¹².

This current study will aid to our understanding of role and safety of cataract surgery for lowering IOP in mild to moderate glaucoma patients with helping us lower the morbidity associated

to the conventional glaucoma surgery at tertiary care Hospital Larkana.

MATERIAL & METHOD

Informed consent was taken after the procedure of the study was properly explained. This was an observational Study with probability consecutive sampling carried out at Department of Ophthalmology, Chandka Medical College Hospital at Shaheed Mohtarma Benazir Bhutto Medical University Larkana. The total 272 patients were split into two groups having cataract and the plan for cataract extraction. Calibrated applanation tonometry was used for measuring IOP before and after the surgery in all the patients. The range of IOP of 12 to 40 mmHg associated with cataract patient selected with following criteria from outpatient department from 40-86 years of age either gender, healthy cornea was used as a control for diabetes mellitus (DM) and hypertension (HTN). Some patient excluded having preexisting glaucoma, uveitis, pseudoexfoliation glaucoma, corneal disease. An informed consent after a proper permission from ethical committee and the hospital was taken for the study and after collecting the data the analysis were conducted by using statistical package for social sciences SPSS 22.0v.

RESULTS

The age range of the patients was between 40 and 86 years, the overall mean \pm SD age of the patients was 58.48 ± 9.28 years. Our study observed that female 143 (52.6%) patients were more affected than male 129 (47.4%) patients (male to female ratio was 1:1.1). The right eye was most commonly affected in 138 (50.7%), while the left eye was affected in 134 (49.3%) cases (Table No.1).

Preoperative intraocular pressure ranged from 12 to 40 mm Hg; overall mean \pm SD intraocular pressure was 18.81 ± 3.80 mmHg. While intraocular pressure checked within one week after surgery ranged from 8 to 26 mmHg, the overall mean \pm SD intraocular pressure was 12.41 ± 2.24 mmHg (p value < 0.001) (table no. 2). A significant decrease in intraocular pressure was 10.49 ± 1.020 mmHg observed at one month postoperative follow-up (p value < 0.001).

Table 1: Demographic Variable n=272

Variable	Patients	Percentage
Age (Means Age 58.48±9.28 years)		
• ≤ 50 years	85	31.25%
• > 50 years	187	68.75%
Gender		
• Male	129	47.42%
• Female	143	52.57%
Affected Eye		
• Right eye	138	50.73%
• Left eye	134	49.26%

Table-2: Intraocular Pressure Before and after Surgery n=272

Tonometry	Results			
	Patients	Mean (mmHg)	Std. deviation (mmHg)	P value
Pre-operation IOP	272	18.81	3.80	
Postoperation IOP within week	272	12.41	2.24	<0.001
Postoperation IOP after one week	272	11.07	1.466	<0.001
Postoperation IOP after two week	272	10.65	1.124	<0.001
Postoperation IOP after three week after surgery	272	10.53	0.994	0.001
Postoperation IOP after one month	272	10.49	1.020	<0.001

DISCUSSION

The glaucoma is considered to be a predisposing factor for Cataract making itself the second and cataract the first most common worldwide cause of visual loss. Some literature suggest that the peripheral iridotomy, filtration surgery, and some of the medicines used for decreasing the intraocular pressure (IOP) in glaucoma are cataract producing culprits. The options of treatment in patients with cataract producing the visual impairment in the patients with glaucoma is usually difficult and is influenced by age of the patient, type and severity of the glaucoma, response to the conservative management of antiglaucoma medication and the severity of IOP¹⁴.

The patients inclusive of our study were 40 to 86 years of age with the mean age of 58.48±9.28 years. The peak ages of 5th and 6th decade also comparable to other studies showing peak at 6th decade (78.91 ± 7.9 years) with further addition of increased incidences of cataract with advancing age irrespective of gender¹⁵.

According to Lewallen et al. (2009) the females get affected by cataract more but both the genders are equally benefited by surgery. Out of 272 patients in this study, 129(47.4%) were male and 143(52.6%) were female. Overall male to female ratio was 1:1.1.

According to Roland Lee more males are effected then females as he reported them 38(55.88%) were male and 30(44.11%) female respectively¹⁶. The transmission of light fibers gets halted by the old accumulative and newly formed cortical lens fibers over the age if the old ones are not removed which appear as pigment in humans, as this processes is associated with age, so the cataract usually manifest in old age. Females are effected more than males especially of Hispanic and African Americans in origin than in Caucasian Americans^{17,18}. With all the publications and ongoing studies over role of cataract surgery in lowering IOP if we reach a specific mechanism of action and phacoemulsification to be used as an option for decreasing IOP then all of the guidelines will need to be changed for treatment for patients having both cataract and glaucoma at the same time¹⁹. The range of intraocular pressure before surgery in our study was 12 to 40 mmHg with overall mean+SD intraocular pressure was 18.81+3.80 mmHg, the reduction within seven days after the surgery was mean+SD as 12.41+2.24 mmHg (p value <0.001). These results of our study are in accordance with the literature provided by Bigger et al, Shingleton et al, Poley et al and

Mansberger, who suggested an ultimate decrease in IOP in patients with cataract and glaucoma together.^{20,22}. A significant mean difference in before and after the surgery readings of IOP of 18.81+3.80 mmHg and 10.49+1.020 mmHg respectively was suggested by our study which is consistent with the results provided by Maria Picoto.

CONCLUSION

It is to be concluded in our study that a noteworthy decrement in IOP post cataract surgery was observed which can be a first basic step in management of mild to moderately raised IOP while some of the patients may hold on to the normal IOP after the extraction of cataract.

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