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CHANGES IN INTRA OCULAR PRESSURE AFTER PHACOEMULSIFICATION WITH INTRAOCULAR LENS IMPLANTATION.

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ABSTRACT... Objectives: To study the changes in intra ocular pressure (IOP) after phacoemulsification with intra ocular lens implantation. **Study Design:** Quasi experimental study. **Setting:** Lahore General Hospital, Lahore. **Period:** From 1-3-2017 to 30-9-2018. **Material & Methods:** The study was conducted after getting approval from "Ethical Review Board" of Lahore General Hospital, Lahore. Patients presenting to the Eye OPD Lahore General Hospital were assessed for inclusion and exclusion criteria. All patients (n=) diagnosed with cataract significantly decreasing vision were selected. Patients having any coexisting ocular pathology i.e. corneal opacity, Glaucoma etc. were excluded from study. Pre operatively intraocular pressure was measured on slit lamp with the applanation tonometry. The patients were called for follow-up after at which time Visual acuity and intraocular pressure was again measured and findings recorded in the proforma. All the surgeries were performed by single surgeon. **Results:** Pre-operative mean intra ocular pressure was 22.02 ± 1.403 mm Hg which reduced significantly to 20.39 ± 1.363 mm Hg, 19.61 ± 1.418 mm Hg, 18.94 ± 1.738 mm Hg after one day, one week and one month of surgery respectively. **Conclusion:** Phacoemulsification cataract surgery leads to a decrease in intraocular pressure.

Key words: Intra Ocular Pressure, Phacoemulsification, Tonometry.

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INTRODUCTION

Cataract surgery is one of the most frequently executed surgeries around the globe. In this surgery the opaque cataractous lens is removed and is replaced by an artificial intraocular lens.¹ The history of cataract surgery goes back two centuries where it started as couching in this part of the world. It was improved to extracapsular cataract extraction providing capsular support for the implantation of intra ocular lens.^{2,3} Currently, phacoemulsification is the surgery of choice for cataract due to its minimal per and Post-operative complications and an early visual recovery with better patient comfort.^{4,5}

The effect of phacoemulsification on intraocular pressure has been reported in both glaucomatous and non-glaucomatous patients.⁶ The purposed mechanism is widening of irido-ciliary angle.^{7,8}

The goal of this study was to observe the

effect of phacoemulsification on dynamics of Ocular pressure of non-glaucomatous Pakistani population. Absence of local literature on this topic was the rationale to conduct this study.

METHODOLOGY

Ethical approval of the study was obtained from "Ethical Review Committee" of Lahore General Hospital, Lahore. Patients presenting to the Eye OPD Lahore General Hospital were assessed for inclusion and exclusion criteria. All patients (n=) diagnosed with cataract requiring surgery were included in study. Patients having any coexisting ocular pathology i.e. Corneal opacity, Glaucoma etc were excluded from study. Pre operatively intraocular pressure was measured on slit lamp with the applanation tonometry.

After aseptic measures, opsites was applied on the eye to be operated and stab incision was made at the limbus. Viscoelastic was injected into the

anterior chamber and continuous curvilinear capsulorhexis was performed. The lens nucleus was separated from lens cortex and lens cortex was separated from lens capsule by hydro dissection and hydrodilination. The lens was the emulsified by phacoemulsification and an intraocular lens was implanted. Post-operative steroid and antibiotic drops were given every 4 hours for two weeks and 4 times daily for the next two weeks. The patients were called for follow-up after at which time Visual acuity and intraocular pressure was again measured and findings recorded in the proforma. All the surgeries were performed by single surgeon.

All data analysis was carried out on SPSS version 22 for windows. Quantitative variables were Mentioned as mean and standard deviation values, however the qualitative variables were mentioned as frequency and percentages. Bonferroni Post Hoc Test was applied to determine the difference between Intraocular pressure Pre-Operatively and Post-Operatively. P-value ≤ 0.05 was considered as statistically significant.

RESULTS

Majority of patients were male (56.1%) and right eye was operated in most of the patients (Table-I). 67.4% patients had a preoperative visual acuity of 6/60 as measured on snellen’s visual acuity chart which returned to 6/6 in 59.8% patients one month after surgery (Table-II).

Mean age of patients in study sample was 60.24 ± 5.540 years. Pre-operative mean intra ocular pressure was 22.02 ± 1.403 mm Hg which reduced to 20.39 ± 1.363 mm Hg, 19.61 ± 1.418 mm Hg, 18.94 ± 1.738 mm Hg after one day, one week and one month of surgery respectively (Table-III). The decrease in intraocular pressure was highly

significant on statistical analysis.

Sr. No		Frequency	Percentage
1	Gender		
i	Male	74	56.1%
ii	Female	58	43.9%
2	Laterality		
i	Left	56	42.4%
ii	Right	76	57.6%

Table-I. Gender and laterality of patients

Sr. No	Visual Acuity	Frequency	Percentage
1	Pre-Operative		
i	6/60	89	67.4%
ii	6/36	43	32.6%
2	1 Month Post-Operative		
i	6/6	79	59.8%
ii	6/9	24	18.2%
iii	6/12	17	12.9%
iv	6/18	10	7.6%
v	6/36	2	1.5%

Table-III. Visual Acuity before and one month after surgery.

DISCUSSION

Kucumen RB et al studied the changes in corneal biomechanical properties and IOP after uneventful phacoemulsification and subsequent placement of intraocular lens. In their study, the intraocular pressure decreased from $17-2 \pm 3.0$ mm Hg to 15.2 ± 3.7 mm Hg. The decrease in intraocular pressure was statistically significant ($p=0.18$).⁹

Dooley I et al have studied the influence of phacoemulsification cataract removal on IOP and morphology of anterior chamber of eye.

Sr. No	Parameter	Minimum	Maximum	Mean \pm Standard Deviation	P Value
1	Age	50	75	60.24 ± 5.540	
2	Pre-Operative IOP	20	25	22.02 ± 1.403	0.000
3	1 Day Post-Operative IOP	18	24	20.39 ± 1.363	0.000
4	1 Week Post-Operative IOP	16	24	19.61 ± 1.418	0.000
5	1 Month Post-Operative IOP	10	23	18.94 ± 1.738	0.000

Table-III. Age and IOP parameters
Bonferroni Post Hoc test was applied to calculate p value.
P value ≤ 0.05 was considered significant.

In their study, intra ocular pressure was measured pre operatively and post operatively and was corrected for central corneal thickness. The intraocular pressure after phacoemulsification decreased on average by 3.3mm Hg.¹⁰

Bhallil S et al have studied the changes in IOP after cataract extraction with incision in clear cornea in subjects without any risk factors. In their study the intraocular pressure decreased by 2.25mm Hg (16%). The researchers concluded that the decrease in intra ocular pressure was not related to thickness of natural lens but was positively associated with the change in anterior chamber depth post operatively.¹¹

Shin HC et al have compared the changes in IOP after cataract surgery in patients prone to occlusion of angles versus patients with normal angles. The pre-operative intraocular pressure in patients with occludable angles was 15.77 ± 2.20 mm Hg versus 14.52 ± 2.65 mm Hg in patients with normal angles. After twelve weeks of surgery, the intraocular pressure decreased significantly in both groups. The mean decrease was 2.31 ± 0.99 mm Hg in the former and 0.77 ± 1.17 mm Hg in later.¹²

Altan-Yaycioglu et al have studied the IOP after cataract surgery in patients with coexisting pseudoexfoliation. They compared the intraocular parameters with a control group. In the pseudoexfoliation group, preoperative intraocular pressure was 17.3 ± 5.4 mm Hg which decreased to 12.8 ± 4.0 mm Hg at one month post operatively but increased slightly to 14.6 ± 3.4 mm Hg after six months of surgery. In the control group, the mean preoperative intraocular pressure was 16.1 ± 4.2 mm Hg, 12.8 ± 3.5 mm Hg at 1 month after surgery and 14.5 ± 2.9 mm Hg after six months of surgery.¹³

Slabaugh MA et al have studied the intraocular pressure changes in patients of open angle glaucoma after phacoemulsification cataract surgery. The patients included in study did not have any history of glaucoma surgery. The mean pre-operative intraocular pressure in the study was 16.3 ± 3.6 mm Hg which reduced to 14.5 ± 3.4 mm Hg after one year of cataract surgery. But 38% of

the eyes required additional medical therapy for glaucoma during the study period.¹⁴

Chen PP et al have studied the literature regarding the effect of cataract surgery on intraocular pressure in diagnosed patients of glaucoma and the need for filtration surgery in such patients. They searched the Cochrane and pub med data bases and the studies relating to primary open angle glaucoma, pseudo exfoliative glaucoma and primary angle closure glaucoma without any previous filtration surgery were included. It was concluded that cataract surgery results in acute and long term reduction in intraocular pressure leading to a rarity of filtration procedure in one year post-surgery.¹⁵

Mensburger SL et al the influence of phacoemulsification on IOP in individuals with ocular hypertension. In their study, postoperative intraocular pressure was significantly lower than before surgery i.e. 19.8 ± 3.2 mm Hg versus 23.9 ± 3.2 mm Hg.¹⁶ Yang HS et al have studied the biometric values of eyes after IOP lowering subsequent to phacoemulsification. They studied the axial length, corneal thickness and iris thickness after decrease in intraocular pressure as a result of phacoemulsification. They documented an 11.8% decrease in intraocular pressure three months after phacoemulsification.¹⁷

Cimetta DJ and Cimetta AC have studied the influence of phacoemulsification on IOP in eyes with pseudoexfoliation without glaucoma. They documented a mean intraocular pressure change of -3.7 mm Hg after three months of surgery ($p < 0.0001$).¹⁸

Lancu R and Corbu C have studied the effect of phacoemulsification on IOP in uncontrolled open angle glaucoma patients. The mean intraocular pressure decreased by 2.1 ± 3.7 mm Hg at six months and by 1.9 ± 3.9 mm Hg after one year of surgery.¹⁹

Poley BJ et al have studied the long term effects of cataract removal by phacoemulsification on intraocular pressure. They divided the sample into subgroups according to preoperative intra

ocular pressure. The mean change in intraocular pressure in the pre surgical group 31-23mm Hg was 6.5mm Hg (27%), 4.8mm Hg (22%) in the 22-20mm Hg group, 2.5mm Hg (14%) in the 19-18mm Hg group and 1.6mm Hg (17%) in 17-15mm Hg group.²⁰

CONCLUSION

Phacoemulsification cataract surgery leads to a decrease in intraocular pressure.






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2	Muhammad Shaheer	Performing surgery, Data collection, Writing of paper draft.	
3	Arooj Amjad	Data collection and analysis, Literature review.	
4	Talha	Data analysis, Literature review.	
5	Hina Mehmood	Data analysis, Literature review.	
6	Ayesha Ahmad	Data analysis, Literature review.	