ORIGINAL ARTICLE

Intra-Operative and Immediate Post-Operative Complications of Cataract Surgery in an Eye Camp

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ABSTRACT

Purpose: To analyze the intra-operative and immediate post-operative complications in patients after cataract surgery in an eye camp.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: The study was conducted in a village of Nawabshah, Sindh, Pakistan from 7th to 9th of February 2020.

Material and Methods: Fifteen hundred patients were screened for visual disabilities of which 150 were selected for the study. They had a visual acuity of less than 6/9 in one or both eyes and had a cataract. The selected patients were operated using either phacoemulsification, extracapsular cataract extraction ECCE), intracapsular cataract extraction (ICCE) or small incision cataract surgery (SICS). The immediate intra-operative as well as post-operative complications on day 1 after surgery were observed.

Results: One hundred and fifty patients were operated. Age ranged from 14 years to 90 years, males were 58.7% and females were 41.3%. The most common procedure performed was phacoemulsification 51.3%, followed by ECCE 30.0%, then SICS 18.0% and ICCE 0.7%. The most common intra-operative complication was posterior capsule rent and the most common post-operative complication was striate keratopathy which was seen in 14.0% individuals. There was a significant association found for post-operative complications with gender with females having more post-operative complications as compared to males (P-value = 0.001 < 0.001).

Conclusion: Camp surgeries when performed with strict sterilization and in experienced hands can play an important role in treating cataract, which is the commonest cause of preventable blindness in developing countries.

Key Words: Cataract, Intra-ocular lens, Phacoemulsification, Extra Capsular Cataract Extraction, Corneal Edema.

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INTRODUCTION

According to a study out of 207.7 million people in Pakistan, 1.12 million were blind with their visual acuity less than 3/60, another 1.09 million [0.93 – 1.24] people were found to have severe vision loss (3/60 ≤ VA < 6/60) and another 6.79 million [6.00–7.74] people had moderate vision loss (6/60 ≤ VA < 6/18)[1]. Muhammed Saleh Memon organized the first national survey which was held between 1987–1990[2] to determine the prevalence and causes of blindness in

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Pakistan. A total of 29,157 subjects from all over Pakistan were examined and the declared prevalence of blind people was 9.03%. There were varied causes of decreased vision but the most common was found to be due to cataract (66.7%). There was a study conducted between 2002 – 2004 and the analyzed data was published in two papers by Dineen et al.[3] and Jadoon et al[4].

There is a serious lack of access to health care facilities in rural areas of Pakistan predominantly due to lack of resources and technical infrastructure combined with reluctance of doctors and other health care personnel to work in these poorly developed areas. The main reason behind this is poor allocation of funds and resources to the health sector of Pakistan.[5,6]

In order to provide health facilities to the people in far flung areas, camps are organized in many developing countries.[7,8] The objective of our research was to perform different types of cataract surgeries feasible in low income countries and to document the intra-operative and post-operative complications so as to prevent them in future by taking appropriate measures.

MATERIAL AND METHODS

This study was conducted over a 3-day period at an eye camp located in Nawabshah, Sindh Pakistan. Patients of all ages were screened for cataract in OPD in the morning hours from 9:00 am till 1:00 pm while surgeries were performed from 2:00 pm till 12:00 am. There was a total of 150 patients selected for cataract surgery. These patients underwent visual acuity assessment and examination of anterior segment and posterior segment. Patients with Diabetic retinopathy, Age related macular degeneration, corneal opacity, advanced glaucoma, conjunctivitis, corneal degenerations and dystrophies, macular scars were all excluded from the study.

The selected patients were then assessed for uncontrolled Diabetes through a blood test for random blood glucose, high blood pressure and blood test for Hepatitis B, Hepatitis C and HIV viruses. Those found to be positive for any of the above were excluded from the study. These patients underwent one of the four procedures phacoemulsification, extracapsular cataract extraction, intracapsular cataract extraction and small incision cataract surgery by four experienced qualified eye surgeons. Any intra-operative complication was recorded during surgery and these patients were seen on post-operative day 1 and their ocular findings were recorded.

The data was analyzed on IBM SPSS version 21.0 and the results were presented as mean ± standard deviation for age, frequency, and percentages for comorbids, gender, type of surgery, intra operative complications and post-operative complications. Statistical association were performed between post-operative complication with age, comorbids, gender, type of surgery using chi-square and fisher's exact test. A p-value of 0.05 or less was considered statistically significant.

RESULTS

Total 150 subjects were analyzed. Table 1 describes the descriptive statistics of all respondents. Mean age was 68.5 ± 11.1 years. Males were 88 (58.7%) and

Table 1: *Descriptive Statistics for Demographics.*

Characteristics	N = 150 (%)
Age in years (Mean ± SD)	68.5 ± 11.1
Gender	
Male	88 (58.7%)
Female	62 (41.3%)
Comorbid	
None	135 (90%)
DM	12 (8%)
HTN	02 (1.3%)
Both	01 (0.7%)
Type of Surgery	
Phaco	77 (51.3%)
ECCE	45 (30.0%)
SICS	27 (18.0%)
ICCE	01 (0.7%)
Intra-Operative Complications	02 (1.3%)
Post-Operative Complications	
None	124 (82.7%)
Corneal edema	21 (14.0%)

Endophthalmitis	01 (0.7%)
Iris prolapse	01 (0.7%)
Others	03 (2.0%)

females were 62 (41.3%). Majority of the patients had no comorbidity i.e. 135 (90%) and few had Diabetes Mellitus i.e. 12 (8.0%). Most common surgery performed was phacoemulsification 77 (51.3%) followed by ECCE 45 (30.0%) and SICS 27 (18.0%). Regarding postoperative complications 124 patients were observed to have none while 21 (14.0%) were found to have corneal edema making it the most common postoperative complication.

Table 2 describes association of post-operative complication with age, comorbids, gender, type of surgery. There were 12 (8%) patients with DM, 02 (1.3%) patients with HTN and one having both Diabetes and Hypertension. There was a significant association of diabetics with postoperative corneal edema.

Post-operative complications were significantly related with gender, age and diabetes (Table 2).

Table 2: *Association of Post-Operative Complications with Demographics.*

Characteristics	Post-Operative Complications			P-value
	None (n=124)	Corneal Edema (n=26)	Total (n=150)	
Age (years)				
10 - < 40	02 (66.7%)	01 (33.3%)	03	0.04*^
40 - < 70	63 (90%)	07 (10.0%)	70	
≥ 70	59 (76.6%)	18 (23.4%)	77	
Gender				
Male	79 (89.8%)	09 (10.2%)	88	0.001**
Female	45 (72.6%)	17 (27.4%)	62	
Comorbid				
None	115 (85.2%)	20 (14.8%)	135	0.02*^
DM/HTN/Both	09 (60.0%)	06 (40.0%)	15	
Type of Surgery				
Phaco	62 (80.5%)	15 (19.5%)	77	
ECCE	41 (91.1%)	04 (8.9%)	45	0.10`
SICS	21 (75.0%)	07 (25.0%)	28	

**Significant at 1%, *Significant at 5%, `Chi-square Test, ^Fisher's Exact Test
DM = Diabetes Mellitus, HTN = Hypertension

DISCUSSION

We reported results of an eye camp that was held in a village where around 150 patients were operated for cataract. Since cataract is the leading cause of blindness worldwide, a similar study was done in Pakistan where cataract was found in 66% of patients.[2] Our study was aimed to analyze intra-operative and post-operative complications occurring due to cataract surgery. Most common procedure performed worldwide is Phacoemulsification followed by ECCE, SICS and ICCE. Rates of complications in both males and females differ and so does the presence of comorbidities leading to increased complication rate.

Striate Keratopathy (or Corneal Edema) was the most common post-operative complication observed in our study. This was consistent with another study done in a rural population in India.[9,10]

Overall, 40% of patients with comorbidities developed corneal edema. Many studies have also reported higher rates of endothelial loss and edema among diabetic patients, factor leading to delayed visual recovery.[11,12] Diabetic corneas do not recover as quickly as in normal persons because of the decreased regulation of fluid balance, enzymatic dysfunction of bicarbonate pump and involvement of aldose reductase with buildup of sorbitol in the corneal stroma. Corneal edema was found in our patients as we examined them both intra-operatively as well as post-operatively and on day 1 of surgery as well while Shakya K et al, also reported the presence of corneal edema even after 1 week post-operatively in diabetic patients.[13] Yang R et al, also reported that corneal endothelium in diabetic patients was more prone to damage from phacoemulsification.[14]

However, based on demographics, it can be noted that increased age and female patients were more likely to develop corneal edema. A study done by Hashemi H et al, in Iran, highlighted the importance of demographics and development of outcomes of cataract surgery which showed females to be at a disadvantage, lower level of education and older age being the factors leading to post-operative complications.[15] Similar are the conditions in Pakistan where lack of resources predominantly in rural areas along with the lack of health care access for patients leads to comorbidities.[16]

For several years, phacoemulsification has been the method of choice for cataract extraction in developed countries. But Phaco is far more dependent on technology than the conventional extracapsular cataract extraction (ECCE). Therefore, it is scrutinized whether Phaco is worth the cost especially in low-middle income countries like Pakistan. As reported by Ruit et al, in a randomized control trial in Nepal on the efficacy of Phacoemulsification vs. manual small-incision extra-capsular cataract surgery (MSICS) where they also compared the cost effectiveness of both the procedures.[17] Results found that MICS was not only cost effective but also a well-suited option with excellent results in developing world where prevalence of cataract was the leading cause of blindness.

In our study we employed all three techniques which best suited the patients. Rate of post-operative corneal edema was less in ECCE as compared to Phaco. There were more patients who had phacoemulsification than ECCE or SICS but since factors such as the presence of comorbidities and other demographics contributed towards the development of post-operative complications in phacoemulsification.

De Silva et al, compared phacoemulsification and ECCE in a Cochrane review where a literature search comparing the two techniques was performed that included 11 randomized controlled trials, which included a total of 1228 participants.[18] It reported better visual outcomes with phacoemulsification and complications were lower with this technique. However, ECCE was cheaper and in lower income countries ECCE may therefore have a role in maximizing the number of people that can be treated with limited resources.[19,20]

Limitation of our study was that it was a single centered study. Further studies are needed with data from multiple eye camps in the future.

CONCLUSION

Camp surgeries when performed with strict sterilization and in experienced hands can play an important role in treating cataract, which is the commonest cause of preventable blindness in developing countries.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board.

Conflict of Interest

Authors declared no conflict of interest.

Authors‘ Designation and Contribution

Asad Azeem Mirza; Assistant Professor: *Research Planning & Data Collection.*

Saba Al-Khairy; Assistant Professor: *Manuscript Writing & Manuscript Drafting.*

Mazhar-ul-Hassan; Professor & Chairman: *Research Design, Final Manuscript Review & Data Analysis.*

Shahid Azeem Mirza; Professor: *Research Planning & Data Collection.*

Saad Aslam; House Officer: *Manuscript Writing & Literature Search.*

Farnaz Siddique; Associate Professor: *Manuscript Review.*

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