Visual outcomes of cataract surgery at the Eye Foundation Community Hospital in Nigeria

Abstract

Aims: To determine the visual outcome of cataract surgeries postoperatively at first day, one and three months.

Study Design: Retrospective, case series study

Place and duration of study: Eye Foundation Community Hospital, Ilese-Ijebu-Imushin, Ogun state of Nigeria. 3-month duration from June 1st 2019 to August 31st 2019.

Methodology: All patients 18 years and above operated for cataract surgery without comorbidity were included in the study. Type of surgery done were manual small incision cataract surgery (MSICS) and phacoemulsification. Patient data were entered into excel spread sheet created for the study. From where it was cleaned up and exported in to statistical package for social sciences 20. Visual outcome was assessed on the first day, first month and at third month post operatively. Snellen visual acuity was converted to log MAR. P value = 0.05 is determined as statistically significant.

Results: Two hundred and fifty (250) patients or eyes were analysed in this study. Two hundred and twenty patients (88%) had MSICS, 30 (12%) had phacoemulsification. Preoperatively, majority (150, 60%) presented with visual acuity less than 3/60 followed by patients with visual acuity between 6/18 to 6/60 (76, 30.4%). Nineteen patients (7.6%) had visual acuity of 6/18 or better. Mean preoperative log MAR was 1.6 ± 0.8 (equivalent to count finger). 3-month post op, two hundred and fourteen (85.6%) had uncorrected visual acuity of 6/18 or better while 231 patients (92.4%) had best corrected (with pinhole) visual acuity of 6/18 or better. (P=0.004 and 0.038 respectively).

Conclusion: There is an appreciable improvement in the visual outcome following cataract surgery.

Keywords: Visual outcomes, Cataract surgery, visual acuity, Eye Foundation

1. **INTRODUCTION:** Cataract remains the principal cause of blindness at 35% globally [1] The Nigerian National Blindness survey in 2007 identified cataract as the commonest cause of severe visual impairment (SVI) and blindness being responsible for 45.3% and 43.0% respectively [2]. World Health Organization (WHO) recommends that the postoperative presenting visual outcome of cataract surgery cases should be 6/18 or better in at least 80% of the cases and best corrected (or pinhole) should be 90% or more [3]. Many studies have been done to study visual outcome after cataract surgery. Many population-based studies done in the developing countries in the 90s showed that postoperative visual acuity (VA) was 40-75% worse than 6/18 [4-7]. But recently mostly hospital-based postoperative VA is in the region of 60-70% of 6/18 or better [8-9]. But there is still gap compared to the WHO guidelines. Unpublished reports have shown many hospitals whose 6/18 or better is just 30% first day postoperative.

Two of the commonest surgical techniques for treating cataract are small incision cataract surgery and phacoemulsification. What determines these choices are the availability and skill of the particular surgeons, availability of equipments, cost of surgery and patients' preferences. The introduction of intraocular lenses (IOLs) and availability of various types of these lenses including multifocal IOLs have further improved the visual outcome of cataract surgery.

Postoperative visual outcome is one of the key factors that develops satisfied patients, build confidence and for increasing the demand for cataract surgeries in the community. While there are several factors associated for poor vision and gaining better visual outcome, it is critical to evaluate and understand them in order to overcome the possible problems. In this context, we decided to conduct a retrospective case series to study the outcome of the cataract surgeries one day, one month and three months post-op.

2. **MATERIALS and METHODS:** This was a retrospective, case series study at Eye Foundation Community Hospital, Ilese-Ijebu-Imushin, Ogun state of Nigeria.

Inclusion and exclusion criteria:

2.1 Data collection

This was obtained from the daily and monthly report of patients that have had cataract surgery. Type of surgery done were manual small incision cataract surgery (MSICS) and phacoemulsification: 3-month duration from June 1st 2019 to August 31st 2019. The patients underwent comprehensive eye examination, which included detailed history; uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA); intraocular pressure measurement with Goldmann applanation tonometer; slit lamp examination; dilated lens examination to assess the lens status; and stereoscopic fundus examination with +78/90 Dioptre lens as well as indirect ophthalmoscope. B scan was done for patients with complete lens opacity. 9 surgeons in total did the surgeries within the study period. 4 Ophthalmologists and 5 residents as shown in table 1.

2.1.1 Statistical analysis

Patient data were entered into excel spread sheet created for the study. From where it was cleaned up and exported in to statistical package for social sciences 20 (SPSS).

Visual outcome was assessed on the first day, first month and at third month post operatively. Categorical variables were expressed in frequencies and percentages. Snellen visual acuity was converted to log MAR. P value = 0.05 is determined as statistically significant.

3. **RESULTS:** Two hundred and fifty (250) patients or eyes were analysed in this study. The mean age of patients who had surgery was 66.9 years ± 10.6 years. They were 128 males (51.2%) compared to 122 females (48.8%). Two hundred and twenty patients (88%) had Manual Small incision Cataract surgery (SICS), 30 (12%) had modern phacoemulsification of cataract. There were 122 right eye (48.8%) and 128 left eyes (51.2%) of patient operated for surgery. Total surgeries done by residents accounted for 9 (3.6%) out of the 250 cases (table 1).

Table 1. showing distribution of surgery as done by Ophthalmologists and residents

	Frequency	Percentage (%)
Ophthalmologists	241	96.4
Residents	9	3.6
Total	**250**	**100.0**

Preoperatively, majority (150, 60%) presented with visual acuity less than 3/60 followed by patients with visual acuity between 6/18 to 6/60 (76, 30.4%). Nineteen patients (7.6%) had visual acuity of 6/18 or better. Mean preoperative logMAR was 1.6 ± 0.8 (equivalent to CF). On first day post op two hundred and nineteen (87.6%) had uncorrected visual acuity of 6/18 or better while 228 patients (91.2%) had best corrected (with pinhole) visual acuity of 6/18 or better. (p=0.164 and 0.039 respectively). First day postoperative mean uncorrected logMAR was 0.4 ± 0.4 (equivalent to 6/15) and mean best corrected logMAR of 0.3 ± 0.4 (equivalent to 6/12). One month post op two hundred and twenty (88%) had uncorrected visual acuity of 6/18 or better while 233 patients (93.2%) had best corrected (with pinhole) visual acuity of 6/18 or better. (p=0.053 and 0.192 respectively). One-month postoperative mean uncorrected logMAR was 0.4 ± 0.4 (equivalent to 6/15) and mean best corrected logMAR of 0.3 ± 0.4 (equivalent to 6/12). 3-month post op, two hundred and fourteen (85.6%) had uncorrected visual acuity of 6/18 or better while 231 patients (92.4%) had best corrected (with pinhole) visual acuity of 6/18 or better. (p=0.004 and 0.038 respectively). The 3-month postoperative mean uncorrected logMAR was 0.4 ± 0.4 (equivalent to 6/15) and mean best corrected logMAR of 0.2 ± 0.3 (equivalent to 6/9). There is a statistically significant difference between preop logMAR acuity and uncorrected logMAR acuity at day 1, 1 month and 3 months ($p<0.001$ respectively) as well as best corrected day 1, 1 month and 3 month postoperative logMAR acuity. ($p<0.001$ respectively). This is as shown in table 2 and table 3. And figures 1 & 2.

Table 2. Showing comparison between preoperative and postoperative visual acuity

	Preoperative visual acuity	Postoperative visual acuity					
		Day 1		1 month		3 months	
		UCVA p=0.164	BCVA p=0.039	UCVA p=0.053	BCVA p=0.192	UCVA p=0.004	BCVA p=0.038
6/18 and better	19 (7.6%)	219 (87.6%)	228 (91.2%)	220 (88.0%)	233 (93.2%)	214 (85.6%)	231 (92.4%)
<6/18 – 6/60	76 (30.4%)	21(8.4%)	12 (4.8%)	23 (9.2%)	10 (4%)	29 (11.6%)	12 (4.8%)
<6/60 – 3/60	5 (2%)	-	-	-	-	-	-
<3/60	150 (60%)	10 (4%)	10 (4%)	7 (2.8%)	7 (2.8%)	7 (2.8%)	7 (2.8%)

Table 3 . showing the mean differences between preop logMAR and postop logMAR acuities at day 1, 1 month and 3 months.

	Mean logMAR			
	Preoperative	**Day 1**	**1 Month**	**3 Month**
	1.6 ± 0.8			
UCVA		0.4 ± 0.4(p<0.001)	0.4 ± 0.4(p<0.001)	0.4 ± 0.4(p<0.001)
BCVA		0.3 ± 0.4(p<0.001)	0.3 ± 0.4(p<0.001)	0.2 ± 0.3(p<0.001)

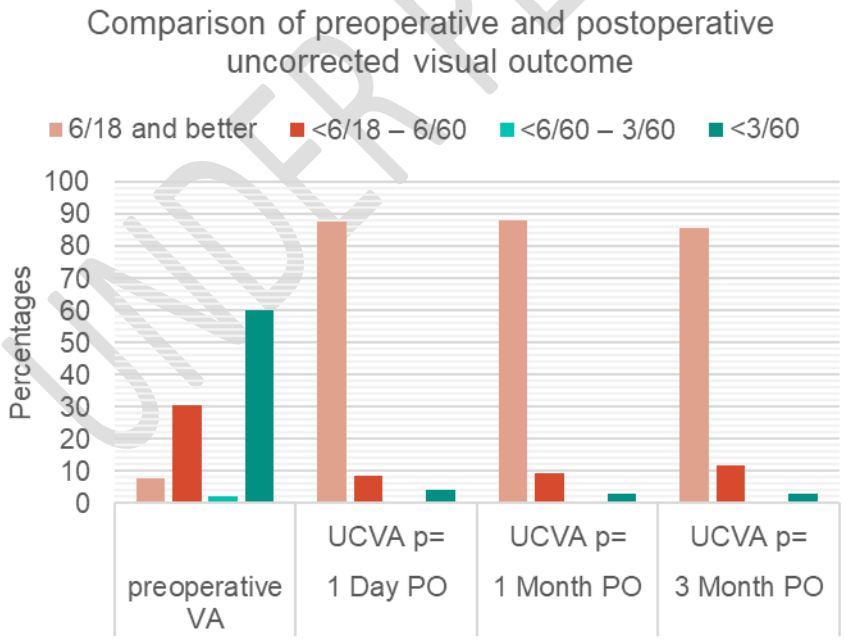

Figure 1: Comparison of preoperative and postoperative uncorrected visual outcome

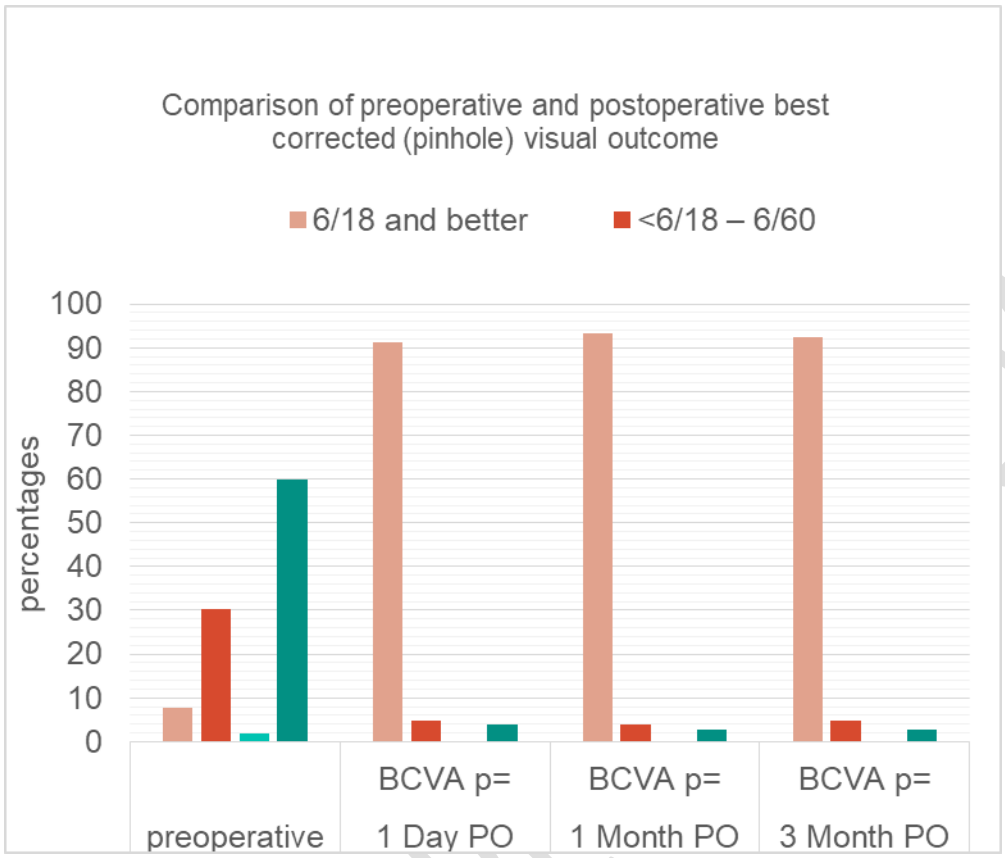

Figure 2: Comparison of preoperative and postoperative best corrected (pinhole) visual outcome

4. **DISCUSSION**: We analysed 250 patients in this study. The mean age of patients who had surgery was 66.9years _+ 10.6 years. This is comparable with the mean age of 66.4 years reported by Bulus et al [10] in a study to evaluate visual outcomes of cataract surgery among rural areas in Southern Kaduna, Nigeria. There were 128 males (51.2%) compared to 122 females (48.8%). This is similar to the findings from studies by Chethena et al in southern india [11] and Udoh et al in Calabar, south/south Nigeria [12], there were also male preponderance among patients. Just like in ours most patients had MSICS + PCIOL implantation in a study done by Rohit et al in Liberia [13] . Preoperatively, majority (150, 60%) presented with visual acuity (VA) less than 3/60. Our study reported lower values of VA compared to study done by Sumathi et al in India [14], who reported preoperative VA of less than 6/60 accounted for 72.9% while higher than 50.7% reported by Udoh et al [12]. Most studies show that in developing countries, majority of patients present to the hospital at a stage at which they are blind or almost blind in at least one eye [12,14] as opposed to developed countries where patients present earlier, with a better visual acuity [15,16].

At 1st day postop, 219 patients (87.6%) had uncorrected VA of 6/18 or better while 228 patients (91.2%) had best corrected VA (with pinhole) of 6/18 or better (p=0.164 and 0.039 respectively) which is similar to 82.3% with VA of 6/18 and better reported by Udoh et al [12]. At 4weeks postop 88% had uncorrected VA of 6/18 or better while 93.2% had best corrected VA (with pinhole) of 6/18 or better (p=0.053 and 0.192 respectively). This is comparable albeit lower than 98.1% and 94.5% reported by Chethana et al [11] and Udoh et al [12] respectively. At 3months postop, 85.6% had uncorrected VA of 6/18 or better while 92.4% had best corrected VA (with pin hole) of 6/18 or better (p=0.004 & 0.038 respectively). The slightly reduced VA may be due to some complications like posterior capsular opacity or macular oedema. The good visual outcome reported in this study can be attributed to the good preoperative biometric calculations as well as the skill and competence of the surgeons.

5. CONCLUSION: According to the WHO and the International Agency for the Prevention of Blindness (IAPB) action plan, >85% should have a good vision of 6/6 - 6/18 post-cataract surgery. Our study has exceeded this target at a four-week follow-up period.

It is however important to continuously audit cataract surgical outcome and train young ophthalmologist to be competent in performing excellent cataract surgeries with brilliant visual outcomes according to WHO recommendation.

Authors' Contributions

Author BTJ designed the study, wrote the protocol and wrote the first draft of the manuscript. Author HAO originated the idea, helped in design of the paper. Authors AA &MCS managed the literature searches. Authors OM & IO managed the analyses of the study. All authors read and approved the final manuscript.

Consent: the authors got permission from the hospital authorities to use hospital data from the medical records.

Ethical approval

Ethical approval was obtained from Olabisi Onabanjo university teaching hospital health research ethics committee. The study was conducted in accordance to the tenets of Declaration of Helsinki.

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