Visual Outcome after Small Incision Cataract Surgery in South-western Nigeria

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SUMMARY

Objective: The aim of this study was to determine the visual outcome of patients who had manual small incision cataract surgery in a high volume secondary eye hospital in southwestern Nigeria, and to identify reasons for poor outcome.

Methodology: This is an observational descriptive, longitudinal study of consecutive patients undergoing cataract surgery at St Mary's Catholic Eye Hospital, Ago Iwoye (SMEH) Nigeria conducted between May and October 2007. A total of 146 patients who presented to the hospital and met the inclusion criteria were recruited for the study. Patients were examined preoperatively, 1st day and 8th week post-operatively. Results were analyzed using the SPSS statistical software. Significant association was taken at 95% confidence interval i.e. < 0.05.

Results: A total of 146 patients who met the inclusion criteria were studied. The mean age was 65.3 ± 10.04 years; and the male to female ratio was 1.4:1. Preoperatively, 110 patients (75.3%) were blind in the operated eye, while 33 patients (22.6%) were blind in both eyes at presentation. At 1st day post-operatively, 17 patients (11.6%) had pinhole visual acuity of 6/6-6/18. Out of 137 patients that had refraction, 114 patients (83.2%) had a visual acuity of 6/6-6/18. The number of blind patients also reduced from 33 (22.6%) to 1(0.7%). Uncorrected refractive error was the commonest cause of poor vision post-operatively.

Conclusion: This study demonstrates that good results can be obtained with small incision cataract surgery with intraocular lens implantation in the developing world. Increasing cataract surgery with IOL implantation should reduce the number of eyes with poor functional vision after cataract surgery.

Key words: cataract, cataract surgery, visual outcome

INTRODUCTION

Cataract is the main cause of avoidable blindness worldwide, with the developing world accounting for 75% of this blindness.[1] The Nigerian National Survey of Blindness found that cataract was responsible for 50% of blindness in Nigeria.[2] In 1997, approximately 10 million cataract operations were performed globally but despite this, cataract blindness is thought to be increasing by 1–2 million/year.[3] To address this increasing backlog, significant progress is being made in increasing the output of cataract surgical services in many developing countries.[4] Cataract control programmes have been established at both local and national levels to reduce the backlog of cataract blindness. These programmes are designed to increase the number of cataract operations and it is assumed that each case operated is a case of restored vision.

However it is becoming evident that the outcome of cataract surgery is not always as good as previously assumed, and much more attention needs to be given to this aspect of surgical services.[5]

Recent population based studies in Nepal,[6] China,[7] and India,[8] show that 40–75% of people who have had cataract surgery have a presenting visual acuity of worse than 6/18 in the operated eye, and 21–53% have less than 6/60. Small incision cataract surgery only became popular in Nigeria less than 5 years ago. Prior to this time and even now most surgeons perform extracapsular cataract extraction.

The aim of this study was to determine the visual outcome of patients who had manual small incision cataract surgery in a high volume secondary eye hospital in Southwestern Nigeria, and to identify reasons for a poor outcome.

METHODOLOGY

The study was carried out at St Mary's Catholic Eye Hospital, Ago Iwoye, Ogun State. The hospital has a vibrant outreach team which consists of all cadres of eye care workers. The outreach team reaches out to neighbouring communities and states to provide primary eye care services at different designated centres within the community and to refer patients who need more comprehensive eye care to the base hospital. Patients who need cataract surgeries are also referred to the base hospital for surgery. The study was carried out over a 6-month period between May and October 2007 at the hospital. It was conducted among adults aged 40 years and above who had visually disabling cataracts. Patients presenting with operable cataract between May and October 2007, who met the inclusion criteria were studied. The inclusion criteria were patients who were aged 40 years and above coming for the first-eye cataract surgery, without ocular co-morbidities such as traumatic cataracts, congenital cataracts, and those who had not had cosmetic cataract surgeries. Patients who had age related macular degeneration (ARMD) and glaucoma were also excluded. A single surgeon carried out all the surgeries and all the patients had preoperative biometry. Individual verbal informed consent was obtained from each participant. The study protocol was approved by the Ethical Review Board of the University College Hospital, University of Ibadan.

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All patients had manual small incision cataract surgery as described by Ahmad et al.[9] Patients were studied prospectively over an 8 week period and data was collected preoperatively, first day and eight weeks post-operatively. Preoperatively, a pre-tested structured questionnaire was administered to assess the socio-demographic data of each patient, and the presenting pre-operative visual acuity unaided and with pinhole in both eyes was also recorded. Visual outcome was categorized using the World Health Organization standard[10] where good vision is 6/6 to 6/18, borderline vision is less than 6/18 to 6/60 and poor vision is less than 6/60. On the first day and eight weeks post-operation their visual acuities (aided and unaided) were recorded. Refraction was done for patients at this time.

Data collected was entered in a data base and analysed using SPSS (Statistical Package for Social Sciences) version 13. A p value < 0.05 was considered significant and analysis by percentages was used whenever appropriate. Other appropriate statistical tools were employed where necessary.

RESULTS

A total of 146 patients met the inclusion criteria and were enrolled for the study. At 8 weeks post-operatively, 137 patients had refraction giving an attrition rate of 6.2% during the study period. The ages of the patients ranged from 40 to 100 years with a mean of 65.3± 10.04. There were 85 male (58.2%) and 61 female (41.8%) patients. Table 1 presents the demographic characteristics of the patients.

Eight patients (5.5%) had coexisting diabetes mellitus while 39 patients (26.7%) had coexisting hypertension. Preoperative ocular examination revealed that 110 patients (75.3%) had presenting visual acuity of < 3/60; 28 patients (19.2%) had severe visual impairment (VA <6/60 – 3/60); while 6 patients (4.1%) had borderline vision (VA< 6/18 – 6/60). Two patients (1.4%) presented with VA ≥6/18 in the eye scheduled for surgery. Thirty three patients (22.6%) were blind in both eyes (VA <3/60); 67 patients (45.9%) were visually impaired in the better eye (VA <6/18 – 3/60); while 46 patients (31.5%) had VA >6/18 in the better eye at presentation. Figure 1 shows the pre- and post-operative visual acuity.

Table 1. Presentation of demographic characteristics of 146 patients

Demographic characteristic	SMEH N= 146	(%)
AGE (on admission)		
40-49	10	6.8
50-59	21	14.4
60-69	61	41.8
70-79	45	30.8
> 80	9	6.2
Total	146	100
SEX		
Male	85	58.2
Female	61	41.8
Total	146	100
OCCUPATION		
Farmer	9	6.2
Artisan/labourer	22	15.1
Trader	70.6	47.9
Driver	6	4.1
Professional	24	16.4
Other	15	10.3
Total	145 =	100
EDUCATIONAL STATUS		
No formal education	69	47.3
Primary education	24	16.4
Secondary education	24	16.4
Tertiary	29	19.9
TOTAL	146 =	100

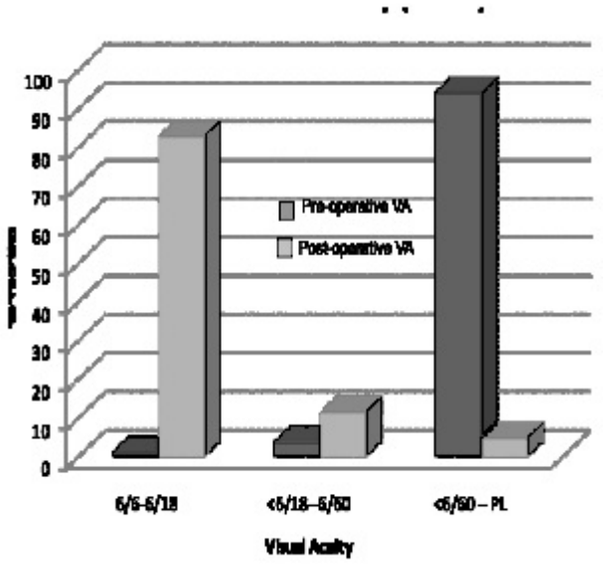

Figure 1. Comparison of pre-and post-operative visual acuity (BCVA)

Table 2 shows the pre-operative and post-operative presenting visual acuity of patient using the better eye. This table shows that cataract surgery reduced the number of patients in the blind category from 22.6% to 0.7% while patients with good vision in the better eye increased from 31.5% to 83.5% post-operatively.

Table 2. Pre- and post-operative visual acuity using better eye

Category of vision	No of patients pre-operatively		No. Of patients post-operatively	
	Unaided	Aided (pinhole)	Unaided	Aided (pinhole)
Bilaterally blind <3/60 (NLP)	33 (22.6%)	33 (22.6%)	1 (0.7%)	1 (0.7%)
Visual impairment in				

better eye > 6/18 3/60	68 (46.6%)	67 (45.5%)	66 (45.2%)	23 (15.8%)
Good vision in better eye > 6/18	45 (30.8%)	46 (31.5%)	79 (54.1%)	122 (83.5%)
TOTAL	146 (100%)	145 (100%)	146 (100%)	146 (100%)

Objective visual outcome unaided 1st day post-operatively showed that only 8 patients (5.5%) had uncorrected good vision (6/6-6/18) while 50 patients (34.2%) had borderline vision (<6/18-6/60). Eighty eight patients (60.2%) had severe visual impairment (<6/60 – LP) unaided. With pinhole however, 17 patients (11.6%) had good vision, 49 patients (33.6%) had borderline vision while 80 patients (54.8%) had severe visual impairment (<6/60 – LP). Table 3 shows the aided and unaided visual acuity 1st day post-operatively, and 8 weeks post-operatively. Corneal oedema was the most common reason for poor vision 1st day post-operatively seen in 70.4% of patients. At 8 weeks post-operatively, the uncorrected visual acuity showed that 54 patients (37.8%) had good vision (6/6 -6/18) while 74 patients (50.7%) had borderline vision. Eighteen patients (12.3%) had severe visual impairment. (table 3) With pinhole however, 116 patients out of 146 patients seen at 8 weeks post-operatively (79.5%) had good vision, 19 patients (13%) had borderline vision while 11(7.5%) had severe visual impairment.

At 8 weeks post-operation, 137 patients had refraction, and 114 patients (83.2%) had good vision while 16 patients (11.7%) had borderline vision; the remaining 7 patients (5.1%) had severe visual impairment despite refraction. Table 4 shows the post-operative complications.

Nine patients (6.2%) did not have refraction because they defaulted their refraction appointment. They were therefore excluded from the analysis on post-operative refraction.

Table 3. Visual acuity on the first day and eight weeks post cataract in 146 patients

1st Day PO VA	Unaided	Pinhole
6/6 – 6/18	8 (5.5%)	17 (11.6%)
<6/18 – 6/60	50 (34.2%)	49 (33.6%)
<6/60 – 3/60	70 (48.0%)	62 (42.5%)
<3/60 LP	18 (12.3%(	62 (42,5%)
Total	146 (100%)	146 (100%)
8 weeks PO VA		
6/6 – 6/18	54 (37.0%)	116 (79.5%)
<6/18 – 6/60	74 (50.7%)	19 (13.0%)
<6/60 – 3/60	13 (8.9%)	6 (4.1%)
<3/60 LP	5 (3.4%)	5 (3.4%)
Total	146 (100%)	146 (100%)
Visual acuity with refraction		
6/6 – 6/18	114 (83.2%)	
<6/18 – 6/60	16 (11.7%)	
<6/60 – 3/60	7 (5.1%)	
Total	137 (100%)	

Table 4. Post-operative complications at eight weeks

Post operative complication	St. Mary's Hospital n= 170	(1%)
Cystoid macular oedema	4	(2.4)
Fribrinous uveitis	3	(1.8)
Endophthalmitis	1	(0.6)
Posterior capsular rent	12	(7.0)
No post-operative complication	126	(86.3)

DISCUSSION

This is a hospital-based observational, study in which patients were seen pre-operatively and followed up for 8 weeks post-operatively. The age distribution of the patients showed that majority were between the ages of 50 and 79 with a mean age of 66.5 years. This age distribution is in conformity with what is seen in cataract patients in many eye clinics in Nigeria. Nwosu et al[11] found a mean age of 66.1 years; Bekibele[12] found a mean age of 64 years, however Adepoju[13] et al found a slightly lower mean age of 58.2 years. A similar age range has also been reported in Africa[14,15] and Asia. [16]

There were more men than women in this study. Several studies have found a male preponderance among cataract patients presenting to eye clinics in Nigeria and Africa.[11,12,14] Although women have been shown to have a slightly increased age adjusted risk of cataract,[17] they do not receive cataract surgery at the same rate as men.[18]

The presenting visual acuity was similar and comparable to those in other African studies.[14] It showed that most patients only seek medical attention when they are blind or almost blind in at least one eye. This is slightly different from what obtains in developed countries,[19] where patients seek medical attention earlier and therefore present with better visual acuity. In the 1998, European cataract outcome study,[19] only 31.5% had presenting visual acuity less than 0.1 (6/60). The results first day post-operatively revealed that there was a low number of patients with good vision unaided compared with what was obtained in a large survey in Africa[4] where good visual outcome at discharge was found among 23% of patients studied. Adepoju et al reported that only 9% of patients had good vision within one week of surgery. The low number of patients with good vision 1st day post-operatively in this study may be due to corneal oedema which was present in 70% of the patients. It is expected that the first day post-operative vision should be better at St Mary's, than was recorded in this study since all patients had biometry; however the effect of corneal oedema may have nullified the advantage of biometry. Corneal oedema was the most common reason for poor vision 1st day post-operatively.

The overall outcome is better than was reported by Bekibele[12] at St Mary's Hospital in a study carried out between October 1998 and October 1999, where he found good vision in 65.5%. Agbeja[20]

et al at University College Hospital Ibadan reported good vision (best corrected) in 61% of patients. It is, however, similar to the best corrected visual acuity reported by Adepoju (83.8%).[13] The values in this study are lower than those obtained by Marjan et al[21] where the visual outcome post-refraction in patients with intraocular lens was 93%.

However it is similar to values (77.1% - 89.4%) reported in a study carried out on a quarterly basis in Kenya.[14] These differences in visual outcome are a result of many factors, which include the surgeon's skill, and presence of intra-operative and post-operative complications.

The post-operative visual outcome in this study was worse than the WHO target guideline[22] for visual outcome of cataract surgery, where the target number of patients with uncorrected good vision (6/6-6/18) should be 80%. In this study, most patients had borderline vision at the end of 8 weeks unaided. This is different from the WHO guidelines where the maximum number of patients with uncorrected borderline vision should not be more than 15%of the target population. The most important reason for this is uncorrected refractive error as seen by the remarkable improvement in the visual acuity post-refraction.

Hening et al[23] in his study of 500 patients found that against the rule, astigmatism was a major cause of uncorrected visual acuity of less than 6/18. The temporal approach has been reported to cause less astigmatism.[24]

In summary, this study confirms that good visual outcome is possible after manual small incision cataract surgery with intraocular lens in the developing world. The importance of monitoring visual outcome cannot be overemphasized as it helps surgeons to find ways of improving their surgical skills.

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