



Visual Outcome of Cataract Surgery at Sheikh Zayed Regional Eye Centre

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Abstract

Aim: The aim of this study is to determine post-operative visual outcomes after cataract surgeries in Sheikh Zayed Regional Eye Care Centre (SZRECC).

Methodology: A hospital based retrospective descriptive case series of cataract surgeries at Sheikh Zayed Regional Eye Care Centre from January 2016 to December 2016 Data was compiled on demographic characteristics, pre- and postoperative visual acuities, biometry, intra ocular lens power and surgical complications. The preoperative and postoperative visual statuses were classified using the World Health Organization (WHO) category of Visual Impairment and Blindness. The standard parameters of assessing outcome of cataract surgery and the WHO criteria for grading the outcome of cataract surgery were used.

Results: A total of 442 unilateral cataract extractions performed in 2016 were reviewed. Mean age of the patients at operation was 68.5 ± 5.5 , Small Incision Cataract Surgery (SICS) with intra ocular lens implant was the major surgical technique. Three hundred and eighty four eyes (86.9%) were blind (VA $< 3/60$) before surgery. The proportion of post-operative eyes with good outcome (6/6-6/18) unaided was 40.5% within 24hours of surgery and 71.7% after best corrections at 6 weeks follow up, borderline (6/18-6/60) unaided was 39.4% within 24hours and 15.6% after best corrections at the 6 post-operative weeks. On the other hand poor outcome ($< 6/60$) unaided was 20.1% within 24 hours after surgery and 12.7% after best corrections at the 6 post-operative weeks. Peri-operatively 23.5% of the operated eyes had complications, which include corneal oedema (9.5%), fibrin (5.9%), hyphaema (3.8), IOL dislocation (1.8%), and posterior capsular rupture (1.1%). Only 2 patients were aphakic post-operatively and only one patient had an IOL implantation whose power was unknown.

Conclusion: 71.7% of patients in this study had very good visual outcome following cataract surgery. Greater attention to biometry, surgical skills upgrading and refractive correction are needed to meet the WHO targets.

Keywords: Cataract Surgery; Cataract Visual Outcome

Abbreviations: WHO: World Health Organization; SICS: Small Incision Cataract Surgery; SZRECC: Sheikh Zayed Regional Eye Care Centre; BCVA: Best Corrected Visual Acuity; SOMA: Senior Ophthalmic Medical Assistants.

Introduction

Cataract accounts for more than half of the world's blindness; it is both the leading and an avoidable cause of blindness

globally [1]. The burden of cataract blindness largely perched on the developing world, where majority of the cataract blind resides [2]. The western sub-Sahara Africa which subsumes the Gambia has the highest prevalence of cataract in adult [3]. The Gambian national survey of blindness and low vision revealed that cataract is responsible for more than 55% of blindness and low vision [4]. Cataract surgery, one of the most common procedures performed worldwide, can effectively restore vision and significantly improves quality

of life [5]. The number of cataract surgeries performed has progressively increased over the years in response to WHO/Vision 2020 strategy to reduce global cataract blindness [6]. With greater life expectancy and increasing ageing population, the cataract surgical rate which is the number of cataract surgery per a million populations per year will need to correspondingly increase to avoid a backlog of untreated cataract patients. The rate of cataract surgery has increased, however the quality of post-operative outcome is not as precise. This necessitated the WHO to describe the good outcome following cataract surgery to be a visual acuity of 6/18 or better after possible correction.

The borderline visual outcome was defined as a visual acuity of less than 6/18 to 6/60, and poor outcome is a visual acuity of less than 6/60. Therefore, a cataract service center is recommended if it has good outcome in more than 85% of all cataract surgeries, a borderline outcome of between 5-15% and a poor outcome of less than 5%. These are the criteria to assess and audit cataract services. A national survey in Bangladesh using these yardsticks showed that 40-75% of post-operative eyes have a presenting visual acuity worse than 6/18, and as many as 50% had visual acuity worse than 6/60 [7]. The aim of this study is to determine the visual outcome of patients who had cataract surgery in a Sheikh Zayed Regional Eye Care Centre (SZRECC) from January 1 to December 31, 2016, and to identify the factors associated with borderline and poor visual outcome.

Methodology

This is retrospective descriptive case series of all cataract surgeries done in adults in sheikh zayed regional eye center Banjul, in 2016. The inclusion criteria were adults 40years and above, having cataract surgery in the indicated eye for the first time. Traumatic cataracts, cataract with possible skeptical outcomes and those cataracts in which indications for cataract surgery are cosmetic were excluded, on account of likely poor prognosis. Case notes of all patients who meet the inclusion criteria were sequentially retrieved. Pre-operative, operative and post-operative data were extracted and analyzed. The main outcome measure was best corrected visual acuity (BCVA) in the operated eye 6 weeks after surgery. Ethical approval for all protocol was obtained from the Gambia/MRC joint ethics committee. Permission was obtained from the management of SZRECC. The visual outcome were classify in accordance to the WHO standard where good vision is better than 6/18, borderline vision is less than 6/18 to 6/60 and poor vision is less than 6/60. The post-operative visual acuity (unaided and best correction) was measured on day one and 6 weeks after the surgery. Data was analyzed with IBM SPSS windows version 16.0 SPSS Inc, Chicago, IL. Chi square statistics was used test

factor associated with poor outcome.

Results

A total of 442 surgeries performed during the review period meet the inclusion criteria and had complete follow-up record. The age of the patients ranges between 40 and 100 years, the average years was 68.6 ± 5.5 years. There were 241 females (54.5%) and 201 males (45.5%). Most of the patients (94.1%) had no co-existing ocular or systemic conditions. Diabetes was the commonest co-morbidity seen in 9(2.0%) patients. All of the patients had small incision cataract extractions and most had intraocular lens implantation. The surgeries were performed by ophthalmologists, senior ophthalmic medical assistants (SOMA) and trainee in Advance Diploma in Ophthalmic Nursing. Intraocular lens was implanted in 440 patients (99.5%), however the right biometric IOL was implanted in only 410 (94.1). Corneal oedema (9.5%), fibrinous uveitis (5.9%) and hyphaema (3.8%) were the commonest peri-operative complications.

Three hundred and eighty four (86.9%) were blind in the index eye peri-operatively (VA<3/60), 56 (12.7%) patients were visually impaired (VA 6/60-3/60) and only 2 patients had visual acuity better than 6/60. Visual acuity in the first post-operative day showed that 179 patients (40.5%) had better than 6/18, while 174 patients (39.4%) had between 6/18 -6/60 and 89 patients (20.1%) had < than 6/60 vision. Six week after operation, unaided visual acuity was found to be better than 6/18 in 211 patients (47.7), 162 patient (36.7%) had visual acuity between 6/18 and 6/60 and 69(15.6%) had visual acuity less than 6/60. Best correction 6 weeks post-operatively, visual acuity of better than 6/18 was seen in 317 patients (71.1%), 69 patients (15.6%) had visual acuity of 6/18-6/60 and 56 patients (12.7%) had visual acuity <6/60.

Age before surgery	Number (%)
40-50	63(14.3)
50-60	132(29.9)
60-70	161(36.4)
>70	86(19.5)
Total	442
Sex	
Female	241(54.5)
Male	201(45.5)
Total	442

Table 1: Demographic characteristics of patients.

Age before surgery	Number (%)
40-50	63(14.3)
50-60	132(29.9)
60-70	161(36.4)
>70	86(19.5)
Total	442
Sex	
Female	241(54.5)
Male	201(45.5)
Total	442

Table 2: Co-morbidity with cataract.

Surgeon	Number (%)
Ophthalmologist	47(10.6)
Senior ophthalmic medical assistant	337(76.2)
Trainee (ADSON)	58(13.1)
Total	442

Table 3: Surgeon.

IOL power implantation	Number (%)
Right	410(92.8)
Wrong	29 (6.5)
No IOL implant	2(0.5)
Unknown	1(0.2)
Total	442

Table 4: Intraocular lens implanted.

Peri-operative complications	Number (%)
Corneal oedema	42(9.5)
Hyphaema	17(3.8)
IOL displacement	8 (1.8)
Posterior capsule rupture	5(1.1)
Pupillary capture	5(1.1)
Endophthalmitis	1(0.2)
Fibrinous uveitis	26(5.9)
No complication	338(76.5)
Total	442

Table 5: Peri-operative complications.

Level of aided VA before surgery	Number (%)
>6/60	2(0.5)
6/60-3/60	56(12.7)
<3/60	384(86.9)
Total	442
Level of unaided VA day 1 after surgery	Number (%)
Better than 6/18	179(40.5%)
6/18-6/60	174(39.4%)
<6/60	89(20.1%)
Total	442
Level of unaided VA 6weeks after surgery	Number (%)
Better than 6/18	211(47.7)
6/18-6/60	162(36.7)
<6/60	69(15.6)
Total	442
Level of aided VA 6 weeks after surgery	Number (%)
Better than 6/18	317(71.7)
6/18-6/60	69(15.6)
<6/60	56(12.7)
Total	442

Table 6: Visual acuity before and after surgery.

Discussion

To the best of our knowledge, this is the first study which assesses the visual outcome of cataract surgery in the Gambia, the regional hub for training middle level ophthalmic health workers. The study showed that most of the patients were between the ages of 61-70years, with an average age of 68.6 year. This is comparable to similar studies done in Ibadan by Olawoye OO, et al. [8] and in Cameroon by Beyiah KP [9]. This study also showed that more female (54.5%) had cataract surgery during the year of consideration compared to the male. Female preponderance were also seen amongst cataract patient other studies in Cameron and India [9,10]. This is however contrasting with the study in Ibadan in which more male patients were operated [8]. This higher number of female patient taking up cataract surgeries may probably be related to the rather higher life expectancy of the Gambian female compare to the male [11], or and a higher prevalence of cataract in women [12].

Most patients (86.9%) present for cataract surgery when they were blind by WHO characterization of blindness if vision is $\leq 3/60$. This was seen in other similar studies [8,9] and may be linked to the notion that cataract had to “mature” as a benchmark for been operable in developing climes. This late presentation may also not be unconnected to the low socioeconomic status people, level of technology and skills deployed to treating cataract in developing countries, where essentially manual small incisions cataract surgery are done. This is contrasting with what is obtainable in developed nations, where cataract is said to be operable when it is symptomatic. The average visual acuity for cataract surgery in US and Denmark was at worse 6/24 and 6/15 respectively [13], here phacoemulsification is the main treatment for cataract. This study also showed that most of the patients were without either ocular or systemic co-morbidity. As much as 94.1% had only cataract, but the commonest systemic co-morbidity was diabetes mellitus and the commonest ocular co-morbidity was glaucoma. This was seen in similar studies in the region [8,9] but contrasting in other study in Asia [14] where most of the cataract operated patients had some co-morbidity. This study also revealed that most (92.8%) of the patients had pre-operative biometry, however only 46.8% had the right intraocular lens power implanted. This is similar to study by Beyiah KP [9] where there was 100% pre-operative biometry for the entire patients and 47% had the right IOL implanted. Similarly unavailability of right IOL in stock was the main reasons in our study and that offered by Beyiah [9]. This study uniquely showed that most (76.2%) of the surgeries were performed by Senior Ophthalmic Medical Assistant (SOMA).

The SOMAs are also called cataract surgeons, middle level ophthalmic ophthalmology trainee [8]. This study revealed that visual acuity of the patients a day after surgery was good in 40.5%, borderline in 39.4 and poor in 20.1%. These visions improved to 47.7%, 36.7 and 15.6% unaided respectively in the sixth post-operative week. With best correction, the visual acuity became good in 71.6%, borderline in 15.6% and poor in 12.7%. An unaided good vision in two fifth of the patients first post-operative day was comparable to an audit done by Ashaye ,et al. [15] in western Nigeria (40.2%), better than Beyiah [9] study 2.3% but less than the Olawoye, et al. [8] study of 66.8%. Good Best Corrected Visual Acuity (BCVA) seen in 71.7% of the patients was less but comparable to what was obtained by Nwosu, et al. [16] and Olawoye, et al. [8] in which 75.4% and 78.8% had good BCVA respectively. This was better than the Cameroonian study where 10.2% had good BCVA in sixth week follow up after surgery [9]. The result is however less than the WHO recommendations of good outcome, BCVA better than 6/18 in $\geq 90\%$ of patients, borderline outcome, BCVA of 6/18-6/60 in $<5\%$ of patients and poor outcome BCVA $<6/60$ in $<5\%$ of patients in the sixth post-operative week.

The inability for visual outcome to meet the WHO recommendation may be related to several factors, ranging from inadequate biometry, cataract co-morbidities, surgery done by trainee, and post-operative complications. This study showed that most of the patient had no post-operative complications. However, 23.5% of the patients had early post-operative, the commonest complications were corneal oedema (9%), intraocular fibrinous reaction (5.7%) and hyphaema (3.8%). These magnitudes of early complications were also noticed in other study [9] but less in these related studies [8,17]. In conclusion, this study has shown that visual outcome after cataract surgery can be described as fair. The main causes of poor visual outcome were uncorrected refractive error due to wrong IOL implantation, associated co-morbidity, and surgical complications, especially corneal oedema. The course to meet the WHO recommendations can be achieved by continuous skill acquisition by training, taking care of co-morbidities where possible, and the use of right IOL for intra-operative correction of aphakia after cataract extraction. Regular monitoring, evaluation auditing cannot be over emphasized.

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