

## Original Article

# Visual Outcome after Cataract Surgery in a Tertiary Eye Hospital in Southern Region of Bangladesh

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### Abstract

**Background:** Vision is a very important sense for human life which is directly related with education, performance of work and quality of life. Worldwide cataract is considered one of the leading causes of blindness and visual impairment. Cataract surgery is one of the most commonly performed procedures in ophthalmology. Cataract extraction with intraocular lens (IOL) implantation is the only surgical approach available mostly in developing countries. **Objective:** This study aimed to evaluate the visual outcome who have had their cataract surgery in a tertiary level eye hospital. **Method:** Prospective interventional study was conducted from 1st January 2019 to 31st December 2019 at Sheikh Fazilatunnesa Mujib Eye Hospital & Training Institute (SFMEHTI), Gopalganj. It was a hospital based study of consecutive cataract-operated patients who had age-related cataract with vision 6/24 or less before surgery. For surgery all the patients were evaluated including their relevant investigations with trained ophthalmologist and allowed as fit for surgery. Total 8776 patients who admitted in this hospital and fulfill the eligibility criteria were included in this study. Patients in age of 40 - 80 years were included in the study. The most common procedure was phacoemulsification (PE) with posterior chamber intraocular lens (PCIOL) 4704 (53.6%) followed by small incision cataract surgery (SICS) with posterior chamber intraocular lens (PCIOL) implantation, operated in 4072 (46.4%) eyes. Most of the surgery was done by well-trained ophthalmologists; whereas few surgeries were done by young ophthalmologists under the supervision of senior ophthalmologist. **Result:** Among 8776 patients operated, the most common group was 40-60 years (65.5%). The mean age of the patients was 60.47 years. Male patients were more (52.8%). In post cataract surgery patients, 5967 (68%) eyes had presenting vision >6/18. Visual acuity (VA) <6/60 was found in 176 (2%) eyes. In 8600 (98%) eyes visual acuity (VA) was improved after best correction. Poor visual outcome was significantly associated with the patients who were in older age, gender female, literacy, hearing impairment and SICS& PE surgery techniques. **Conclusion:** This study observed that good visual acuity can achieved in cataract surgery. More attention should be given towards monitoring of cataract surgical outcomes and correction of refractive error after surgery. It is also important to meet the WHO standard of visual outcome after cataract surgery.

**Keywords:** Bangladesh, Blindness, Cataract surgery, Visual outcome.

**Introduction:** On January 1, 2016, leaders of the United Nations member countries implemented the sustainable development goal (SDG) agenda up to 2030. The third most important goals of this agenda were to ensure healthy lives and promote well-being

for all at all ages.<sup>1</sup> Recent data of the World Health Organization (WHO) show 285 million visually impaired people of all ages globally, which represent 80% of the total health burden (WHO, 2017). A joint program of the WHO and the International Agency for

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the Prevention of Blindness (IAPB) launched VISION 2020: The Right to Sight in 1999 to eliminate avoidable blindness by the year 2020.<sup>2</sup> In global scenario, the leading cause of blindness and visual impairment is due to cataract especially in developing countries.<sup>3,4</sup> Bangladesh is a developing country situated in south-east Asia where cataracts is responsible for 50%-80% of total blindness.<sup>5</sup> The first national blindness survey of this country was conducted in 2003, which found that about 650,000 people aged over 30 were blind due to cataract.<sup>6</sup> It also reported that nearly 1,30,000 additional cataract-related blinding cases occur in every year in Bangladesh.<sup>7</sup> This study concluded that there is a need to be establish a sustainable national eye care service to reduce the large backlog of cataract blindness in this country. Cataract extraction and IOL implantation is the most effective and common method of restoring vision from cataract blindness.<sup>8</sup> Assessment of the effectiveness of cataract surgery, the following indicators such as goodvisual acuity outcomes is essential to assess the quality of the service.<sup>9,10</sup> Instead of advanced surgical technologies for cataract, surgical out comes are not satisfactory in low-income countries.<sup>11,12</sup> Cataract outcome related population-based surveys from India, Nepal and other developing countries have reported a poor outcome ranging from 9% to 41%<sup>13-16</sup>, but the World Health Organization (WHO) recommended that poor outcome should be less than 4%. In Bangladesh, two studies conducted in a population setting also found similar poor outcomes.<sup>6,17</sup> In Bangladesh, one study in a clinical setting nearly met the WHO standard, but this study only investigated the visual outcome of manual small incision cataract surgery.<sup>18</sup> That is why, more similar studies are required to evaluate the visual outcomes of cataract surgery in Bangladesh. The aim of this study was to evaluate the visual outcome in patients who have experienced cataract surgery in a tertiary level eye hospital in southern region of Bangladesh.

### Method:

A hospital-based prospective interventional study was conducted on patients who had admitted in Sheikh Fazilatunnessa Mujib Eye Hospital & Training Institute (SFMEHTI), Gopalganj, Bangladesh; from 1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2019 for cataract surgery. Annually this hospital performs approximately 10,000 cataract surgeries. After registration all patients were sent for check

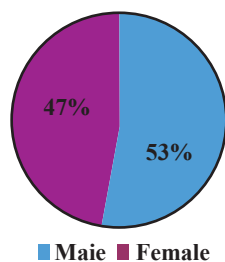
vision. Visual acuity (VA) was checked by trained nurses. After checking VA, patients were sent to ophthalmologists for management. After an over view of ocular adnexa with torch light, anterior segment examination was done with slit lamp; posterior segment examination was performed after dilating the pupil using direct and indirect ophthalmoscope. Patients needed medical treatment and refraction was given at the same time. The patients needed to check blood pressure (BP), intraocular pressure (IOP) and sac patency test (SPT) were sent to another room; where these was done by trained nurses. The patients who needed surgical intervention for age related cataract was sent for relevant investigations and evaluated before admission in indoor. Patients in age of 40-80 years with age related cataract (ARC) were included in the study. Patients were grouped by age into four age groups (40-50 years, 51-60 years, 61-70 years and 71-80 years).

All the patients with age-related cataract who meet the inclusion criteria and pre-operative visual acuity 6/24 or less were included. Patients were chosen, as the purpose of this study is to assess the outcome of the age-related cataract after cataract surgery. Complicated cataracts, traumatic cataracts, cataract combined with glaucoma, corneal pathology and vitreo-retinal diseases were excluded. Because of poor prognosis for vision after cataract surgery, these patients were excluded. After admission written informed consent was taken from all patients. Preoperative preparations like marking of eye, tying of hand base (R/L) for reconfirm of side, dilatation of pupil, medications use were done in ward. The World Health Organization (WHO) recommended manual for Monitoring Cataract Surgical Outcomes (MCSO) were followed to define the procedures and cataract surgery outcomes.<sup>19,20</sup>, The most common procedure was phacoemulsification (PE) with posterior chamber intraocular lens (PCIOL) implantation followed by small incision cataract surgery (SICS) with posterior chamber intraocular lens (PCIOL) implantation. One eyed patients, most of hard cataract were selected for SICS; rest were selected for PE. Most of surgery was done on next day of admission by trained ophthalmologist whereas few surgeries were done by young ophthalmologists with the presence of senior ophthalmologist. All pre-operative data were collected retrospectively from the discharge records, whereas best corrected visual acuity was collected prospectively from the

patients in OPD. Postoperatively distance visual acuity (VA) was recorded in 1st POD, 7th POD and 60th POD by using illuminated Snellen charts. 1st POD (postoperative day) visual acuity (VA) was recorded in the next morning of surgery in ward and subsequent VA was done in OPD (outpatient department). Best corrected visual acuity after refraction was also done in last follow-up on 60th POD. Visual acuity of each eye was classified according to the WHO recommended standard cataract outcome grading; where good vision indicates VA 6/6 to 6/18, borderline vision indicates VA less than 6/18 to 6/60, and poor vision is less than 6/60. The data were recorded and analyzed using SPSS statistics program.

**Result:**

After meeting the inclusion criteria 8776 patients were enrolled in this study. The mean age of the patients was 60.47 years, ranging from 40 to 80 years old. The most common group was 40-60 years (65.5%). Male participation 4634 (52.8%) was greater than female 4142 (47.2%). The most common procedure was phacoemulsification (PE) with posterior chamber intraocular lens (PCIOL) 4704 (53.6%) followed by small incision cataract surgery (SICS) with posterior chamber intraocular lens (PCIOL) implantation, operated in 4072 (46.4%) eyes. Visual acuity outcomes in Table 3 show that good presenting visual acuity (6/6 - 6/18) was present in more than half 5964 (67.95%) of the cataract-operated eyes, where borderline VA (6/18-6/60) in 2635 (30.03%) eyes and poor visual outcome (VA <6/60) were found in 177 (2.02%) eyes. After best correction, good visual acuity outcome was present in 7747 (88.27%) eyes, and the remaining 1029 (11.73%) eyes had <6/18 vision. Where visual acuity was improved after best correction in 8599 (97.98%) eyes. Poor visual outcome was significantly associated with the patients who were in older age, gender female, literacy, hearing impairment and SICS & PE surgery techniques.



**Figure 1:** Pie chart shows male patients were more 53%.

**Table 1: Types of surgery with number of patients.**

Name of Surgery	No. of Patients	%
PE with PCIOL	4704	53.6
SICS with PCIOL	4072	46.4
<b>Total</b>	<b>8776</b>	<b>100</b>

Table1: shows-Phacoemulsification surgery (PEwith PCIOL) was the highest 4704/8776 (53.6%) in number.

**Table 2: Number of patients according to age.**

Age of Patients	No. of Patients	%
40 – 50	2372	27.0
51 – 60	3376	38.5
61 – 70	2007	22.87
71 – 80	1021	11.63
<b>Total</b>	<b>8776</b>	<b>100</b>

Table 2: shows- highest number of ARC patients was 51 – 60 years age group 3376 (38.5%).

**Table 3: Visual acuity (VA) after cataract surgery (PE & SICS) in 1st POD.**

Level of VA in 1 <sup>st</sup> POD	Category of Outcome	No. of Patients	%
6/6 – 6/18	Good	5964	67.95
<6/18 – 6/60	Borderline	2635	30.03
<6/60	Poor	177	2.02
<b>Total</b>		<b>8776</b>	<b>100</b>

Table 3: shows- most of (98%) patients has satisfactory postoperative VA according to WHO guide line.

**Discussion:**

Outcome of visual acuity after cataract surgery was focused in this study. Collection of a large number of data from 8776 eligible patients was easy and quick being a hospital-based study. Large sample size seems to have been an advantage in this study as it is likely to be representative in terms of volume of cataract surgery performed in a tertiary level eye hospital, SFMEHTI. The number of cataract operations was seen to be higher in patients with an age range from 51 to 60 years (38.5%). Where Ferdosh JU et al found the age range 60 to 69 years at CEITC, Bangladesh.<sup>21</sup> In this study, the patients experienced cataract surgery 52.8% were male and 47.2% were female. These findings were quite closer

to study done by Sethi S et al at Khyber Teaching Hospital, Peshawar; where 60.6% were male and 39.1% were female.<sup>22</sup> In this study the most common procedure was phacoemulsification (PE) with posterior chamber intraocular lens (PCIOL) (53.6%) eyes as most of the surgeons were senior ophthalmologist. SICS was found the most preferred surgical procedure among the other techniques in similar other studies, despite the fact that overall better visual outcome was seen in phacoemulsification (PE) surgery.<sup>4,12,14,21</sup> Where SICS was highly preferred as it is cost-effective and can produce a considerably improved visual outcome. The overall outcome of good presenting VA (67.95%) was comparable and better than what was reported in other cataract-related studies conducted in Bangladesh and its neighbors such as India, Pakistan and Nepal.<sup>6,16-17,20-21</sup> but the finding of visual outcome was poor when compared with developed countries.<sup>23</sup> Good visual acuity outcome was present in 7747 (88.27%) eyes; and the remaining 1029 (11.73%) eyes had <6/18 vision after best correction. Khanna RC et al found best corrected visual acuity (BCVA) was  $\geq 6/12$  in 84.3% patients in SICS group as compared with 88% in phacoemulsification group.<sup>24</sup> In this study visual acuity was improved after best correction in<sup>97</sup>. 98% eyes. Multiple studies of cataract outcome also demonstrate that in many cases the outcome of visual acuity had improved after best correction. Few studies claim that incorrect biometry calculation or IOL section might be the reason for this high amount of refractive error.<sup>12, 25</sup> In this study, older age of the patients was found to be one of the factors for visual outcome <6/18. A growing body of research also evidenced that there is an association between older age and poor vision outcome.<sup>6, 12, 20</sup>

#### Limitations:

1. Multiple surgeons were performed the cataract surgeries.
2. Subsequent postoperative follow-up were challenging.
3. Not all age group of patients were included.
4. Did not assess the ocular co-morbidity and posterior capsular opacity (PCO).

#### Author's Contributions:

All the authors were contributed in various parts of the publication from concept and design, acquisition of data, analysis & interpretation of data and drafting of the manuscript.

#### Declaration of Conflicts:

The authors declare that, there is no conflict of interest regarding the publication of this article.

#### Conclusion:

Cataract surgery can restore good visual acuity. However, the visual outcome needs to be improved to meet the WHO standard, and more attention should be directed towards monitoring of outcomes and correction of refractive surprise after cataract surgery.

#### Recommendation:

Further studies are recommended to evaluate the co-morbidities and their effects on visual outcome after cataract surgery. In developing countries like Bangladesh, regular monitoring of cataract surgical outcome should be carried out at hospital and population level so that obstacles can be identified in this area and appropriate measures can be taken to fill the gaps.

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