SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Ophthalmology

Visual Outcome after Phacoemulsification Surgery in KWMC&H, Mirzapur, Tangail

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DOI: https://doi.org/10.36347/sasjs.2025.v11i12.007 | **Received:** 08.10.2025 | **Accepted:** 01.12.2025 | **Published:** 05.12.2025

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Abstract **Original Research Article**

Background: Cataract being one of the leading causes of avertible blindness has been found to be quite prevalent in developing countries like Bangladesh. The National Program for Control of Blindness (NPCB) aims at reducing blindness due to cataract via cataract control programs. The commonly performed surgery is the Phacoemulsification surgery. The aim of this study was to determine the visual acuity and outcome in patients who underwent Phacoemulsification surgery in KWMC&H. ***Methods:*** This retrospective longitudinal interventional study was conducted in a tertiary hospital in KWMC&H, over a period of six months from January 1, 2023, to June 30, 2023 at the Department of Ophthalmology. A total of 101 eyes underwent Phacoemulsification surgery and were followed up for one month to assess their postoperative visual outcome and complications, if any. During this period, they were started on antibiotic + steroid combination eyedrops, which were tapered over four weeks. ***Results:*** Results were assessed based on visual grading categorized by the World Health Organization (WHO). A total of 89 (88.11%) patients had good vision, i.e., visual acuity of 6/6 - 6/18, followed by 12 (11.88%) who had moderate vision i.e., visual acuity of <6/18 - 3/60, and none were blind or with visual acuity of <3/60. Complications seen intraoperatively in five patients (4.98%) were posterior capsular rent, respectively, and postoperatively 3 (2.97%) patients showed hyphema. ***Conclusion:*** This study proves that a good visual outcome with a low complication rate can be achieved after Phacoemulsificatio with posterior chamber intraocular lens implantation.

Keywords: Senile cataract, blindness prevention, visual outcome, best corrected visual acuity.

INTRODUCTION

Cataract is one of the leading causes of avertible blindness, contributing to 66.2% of the estimated 50 million cases of preventable blindness [1]. Blindness is appreciably severe in developing countries like Bangladesh due to ignorance, poverty, and the dearth of medical resources in the peripheral areas [1,2].

The National Program for Control of Blindness (NPCB) via cataract control programs aims at clearing the backlog of blindness due to cataract [3]. These programs are increasing the number of surgical facilities dispensed, commonly Phacoemulsification, which is a technique that can be employed in suboptimal conditions and incurs a maintenance cost as compared to SICS [4]. Phacoemulsification takes less time to perform and is more cost- effective and the most appropriate method to be performed in developing countries for high-volume cataract surgeries [5]. However, the outcomes of Phacoemulsification and the improvement in visual acuity of patient's post-surgery are not always as anticipated, and more attention needs to be paid to the surgical amenities being provided [6].

Phacoemulsification has revolutionized cataract surgery by allowing small-incision procedures, faster recovery, and better postoperative visual outcomes [7]. Nevertheless, achieving optimal visual improvement depends on multiple factors, including surgical expertise, quality of preoperative assessment, accurate intraocular

lens power calculation, and adherence to postoperative care protocols [8]. In developing countries, including Bangladesh, challenges such as limited trained personnel, inconsistent availability of surgical equipment, and patients presenting with advanced cataracts can affect outcomes [9].

Monitoring and documenting postoperative visual results is crucial for evaluating the effectiveness of cataract services, identifying areas needing improvement, and ensuring patient safety [10]. Several studies worldwide have shown that careful patient selection, meticulous surgical technique, and appropriate postoperative management can minimize complications and maximize visual recovery. However, limited data exist regarding the outcomes of phacoemulsification surgeries in newly established tertiary care centers in peripheral regions of Bangladesh, where resources and surgical experience may vary from urban centers [7, 11].

This study was therefore designed to assess the visual outcomes and complication rates following phacoemulsification with posterior chamber intraocular lens implantation at Kumudini Women's Medical College (KWMC), Mirzapur, Tangail. By analyzing postoperative visual acuity according to World Health Organization (WHO) criteria, the study aims to provide evidence of the effectiveness and safety of cataract surgical services in a resource-limited setting.

METHODOLOGY & MATERIALS

This retrospective longitudinal interventional study was conducted in a tertiary hospital in Mirzapur (KWMC&H) over a period of six months from January 1, 2023, to June 30, 2023 at the Department of Ophthalmology.

Inclusion Criteria:

- All the patients above the age of 40 years having diminution of vision due to cataract who underwent cataract surgery by Phacoemulsification were included in the study.

Exclusion Criteria:

- Patients below the age of 40 years and those with other causes of diminution of vision, such glaucoma, diabetic retinopathy, corneal opacities, any macular pathology, and traumatic cataract, were excluded from the study.

JNMC Institutional Ethics Committee on Human Subjects Research approved the study (MDC/DOME/220). After taking a brief history, visual acuity, intraocular pressure by non-contact tonometer, lacrimal sac syringing, blood pressure, random blood sugar, and physician review for fitness, fundus examination was conducted for all the patients. HbsAg serology was performed for all patients. Antibiotic eyedrops were instilled one day prior to the surgery. Tropicamide with phenylephrine eyedrops were used to dilate the pupil. All the surgeries were performed by a single surgeon after taking informed and written consent for the surgery.

In terms of operative procedure, under all aseptic precaution, peribulbar block was given. Universal eye speculum was put. All the patients had phacoemulsification with foldable posterior chamber intraocular lens.

Postoperatively, oral antibiotics were given for three days. Analgesics were given if needed. Antibiotic + steroid combination eyedrops were tapered over four weeks. Tropicamide eyedrops were given to put once at night for one week. Postoperatively, the visual acuity was assessed on day 1, first week, and fourth week.

Cataract is defined as the clouding of the crystalline intraocular lens occluding the rays entering the eye and partially or completely impeding the red reflex on distant direct ophthalmoscopy causing visual impairment [12]. 7 Visual outcome post Phacoemulsification was categorized by the World Health Organization (WHO) as follows [1]:

- Normal to mild visual impairment: 6/6 - 6/18
- Moderate visual impairment: 6/18 - 6/60
- Severe visual impairment: <6/60 - >3/60
- Blind: <3/60

RESULTS

The staging of cataract, as shown in Table 1, was such that majority, i.e., 73 (72.27%) were immature cataracts and 28 (27.72%) were mature cataracts. Table *2* shows the same. A total of 101 eyes of 94 patients who met the inclusion criteria were included in the study. Age of the patient ranged from 40 to 80 years, with a mean age of 62.37 ± 9.01 years. Of the patients, 62 (61.38%) were females and 39 (38.62%) were males.

Among 101 operated eyes, the visual acuity showed that 89 (88.11%) patients had good vision, i.e., visual acuity of 6/6 - 6/18, followed by 12 (11.88%) patients who had moderate vision, i.e., visual acuity of <6/18 - 3/60, and none were blind or with a visual acuity of <3/60 (Table 3).

Using the McNemar test, there was significant change in the distribution of vision before and after surgery.

Intraoperatively, 5 patients (4.98%) incurred complications of and posterior capsular rent, respectively., whereas the posterior capsular rent was managed by placing the PCIOL in the sulcus. 3 (2.97%) patient showed grade one hyphema. The hyphema resolved over the following week. A total of 93 (92.08%) eyes showed no intraoperative or postoperative complications. Table *4* shows the complication statistics.

Table 1: Staging of cataract

Staging	Number of eyes (%)
Immature	73 (72.27%)
Mature	28 (27.72%)

Table 2: Distribution of age in the study

Age (in years)	Number of patients	Percentage (%)
40-49	11	10.89%
50-59	29	28.71%
60-69	35	34.65%
70-79	21	20.79%
80-89	5	4.95%

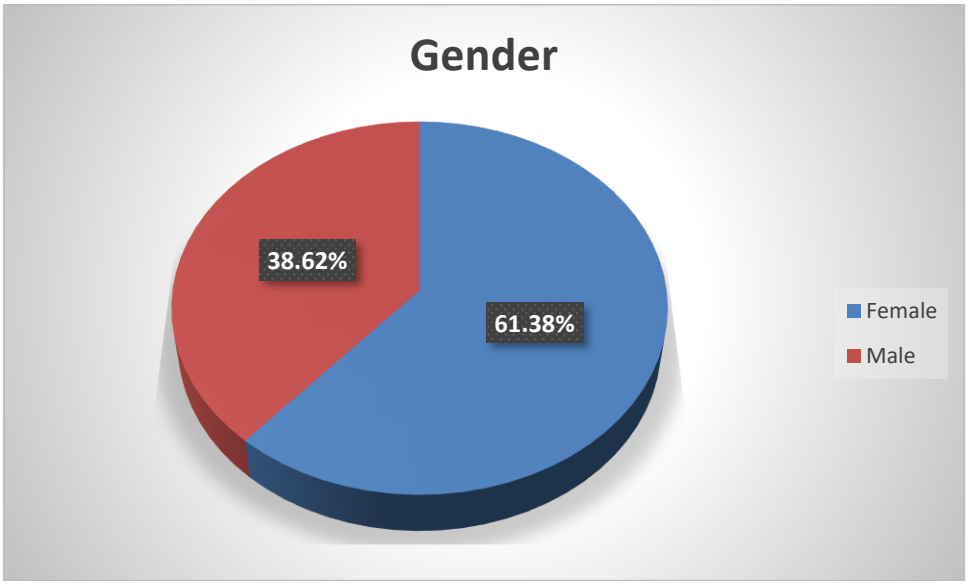

Figure 1: Distribution of gender in the study

Table 3: Pre- and postoperative visual acuity

Variables		No. of patients	
		Before Phacoemulsification	After four weeks of Phacoemulsification
Visual Impairment	Blind (<3/60)	49 (48.51%)	0(0%)
	Moderate vision (<6/18 - 3/60)	43 (42.57%)	12 (11.88%)
	Good vision (6/6 - 6/18)	9 (8.9%)	89 (88.11%)

Table 4: Complications statistics

Intraoperative complications	Number of eyes (%)
Posterior capsule rent	5(4.96%)
Iris prolapses	1 (0.99%)
Postoperative complications	**Number of eyes (%)**
Haptic in the AC	nil
Hyphaema	3 (2.97%)

DISCUSSION

This was a retrospective longitudinal study conducted in a tertiary hospital in Mirzapur assessing the visual outcomes and complications over four weeks in patients who had undergone Phacoemulsification.

The age distribution was found to be such that majority were in the range of 60-69 years, with a mean age of 62.37 ± 9.01 years. This is very similar to previous studies. Wetarini *et al.,* [4] found 43.5% of the cataract patients in this age group, with a mean age of 63 ± 10 years in Bali, Indonesia. Nwosu and Onyekwe [13] in Nigeria showed comparable findings of a mean age of 64 years, while studies conducted in India also showed the same. Khandekar et al. conducted a study in central India and found 41.86 % to be in the age group of 61- 70 years [14].

More women (61.38%) were found to have cataract in our study. It has been proven in prior studies that women have a more age-adjusted risk of developing cataract than men. This could be due to longer average lifespan of women and thus having a higher prevalence of undergoing cataract surgery [14-17].

Cataract is one of the leading causes of blindness in the world mainly in India. The presenting visual acuity is parallel to other studies [18]. 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, as opposed to developed countries where patients present earlier, with a better visual acuity [19-24]. In a study conducted in Sub- Saharan Africa, the predominant (36.9%) visual acuity was hand movement close to face [19]. A study conducted in Nepal concluded that one in eight patients of the sample population operated for cataract were blind at presentation [21].

Results were assessed based on visual grading categorized by the World Health Organization (WHO). A total of 89 (88.11%) patients had good vision, i.e., visual acuity of 6/6 - 6/18, followed by 12 (11.88%) who had moderate vision i.e., visual acuity of <6/18 - 3/60, and none were blind or with visual acuity of <3/60. Complications seen intraoperatively in five patients (4.98%) were posterior capsular rent, respectively, and postoperatively 3 (2.97%) patients showed hyphema.

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 [25]. Our study has exceeded this target at a four-week follow-up period.

Assessing visual acuity post-cataract surgery is a routine practice for surgical evaluation. Various factors influence the visual outcome, such as stage of cataract, ocular and systemic co-morbidities, surgical technique, surgical skills, and complications during surgery [26-28].

Our study had fewer overall complications 9 such as posterior capsular rent, iris prolapse, and hyphema, as compared to other studies that revealed higher number complications [14,24,29].

Limitations of the study

The limitation of our study is its small sample size of 101 eyes and a short follow-up duration of one month postoperatively. Thus, a much larger sample size with a longer observation period is ideally required for assessing visual outcomes with accuracy post-phacoemulsification.

Conclusion

This study conducted at a tertiary hospital in mirzapur proves that a good visual outcome with a low complication rate can be achieved after - phacoemulsification with PCIOL implantation. Cataract surgeries are the one and only available solution, and phacoemulsification performed in this study has shown favorable visual outcome. It is an easily available, affordable technique that can be used safely and can be dispensed at a large scale in developing countries. This study proves that phacoemulsification can be used as an effective and affordable treatment option especially in sections of the country that lack advanced resources. It is an excellent tool to eliminate preventable blindness due to cataract.

Financial support and sponsorship
No funding sources.

Conflicts of interest
There are no conflicts of interest.

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