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VISUAL OUTCOME AFTER CATARACT SURGERY AT BENGHAZI OPHTHALMOLOGY TEACHING HOSPITAL

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ABSTRACT

Background: Cataract is the leading cause of blindness and the second leading cause of visual impairment worldwide, accounting for 51% and 33% of all cases, respectively, in low- and medium-income countries bearing a disproportionately high burden. **Aim of the study:** The objective of the study was to evaluate the visual outcome of age-related cataract surgery and identify factors associated with patients' postoperative visual outcomes in Benghazi teaching eye hospital, Benghazi university, Libya. **Patients & Methods:** This cross sectional study was performed in the department of ophthalmology, Benghazi university during the period from December 2023 to March 2024 (4 months) on 40 patients over 40 years who underwent cataract surgery during the study period. Data were collected from medical records on age, gender and visual acuity. **Results:** The mean age was 56 ± 4.3, the high percent of cataract was in the older age group (51-60, 35%). Preoperative Comorbidities in operated eye was present in 18 patients (45%). Preoperative visual acuity and outcome of cataract surgeries at different follow-up visit. At 3 months follow-up visit, 36 patients (90%) had good outcome, those with less than 6/60 were only one patient (2.5%). The most common early post operative complication that occurred in 2 patients (54%) eyes was cornea edema, while last surgical complications occurred only in 2 patients (Vitreous loss and Macular oedema). **Conclusion:** this study shows good visual outcome of cataract surgeries performed in Libya. There is a potential for excellent surgical outcome in Libya if more attention is paid to uncorrected refractive error. The study highlights the need for improved post-operative visual monitoring after cataract surgery in Libya.

KEYWORDS: Cataract surgery. Visual outcome, Astigmatism; Refractive errors.

INTRODUCTION

Cataract is the leading cause of blindness and the second leading cause of visual impairment worldwide, accounting for 51% and 33% of all cases, respectively. The huge burden of cataracts found in low- and mediumincome countries contributes about 90% of cataract-related blindness to the world. Cataract affects mainly old aged people as natural occurring phenomena of aging. In Ethiopia, where 10% of the population is over 50 years old, cataract accounts for 49.9% of blindness and 42.3% of visual impairment, respectively (Mohammed et al., 2023).

Cataract affects daily activities and independent living that leads to diminished quality of life and also has an adverse effect on the physical and mental health of individuals. As result, cataract causes sizeable social and economic disadvantages, especially in poor communities, and contributes to the perpetual cycle of poverty (Glick et al., 2019).

Cataract surgery is the removal of an opacified lens and is usually replaced with an artificial intraocular lens (IOL), and it is the first and last available management of cataracts. It is the most frequently performed elective, effective surgery identified as "Essential Surgeries" by the World Bank (Buchan et al., 2018). World health organization (WHO) recommends that after surgery at least 80% of the operated eyes should have a presenting visual acuity of 6/6–6/18, which is referred to as a good visual outcome, whereas poor visual outcome cases (less than 6/60) should have less than 5%. After the best correction, at least 90% of the eyes should achieve this level of vision. Despite these facts, the outcome of cataract surgery in sub-Saharan countries is below WHO recommendation (Lewallen et al., 2015).

Visual outcome of cataract surgery is measured either as visual acuity in the operated eye or in the patient, in terms of ability to function, quality of life, or economic rehabilitation. The outcome can be assessed with full spectacle correction ('best visual acuity') or with

presenting vision. Good outcome is defined as 6/6 – 6/18 (available and best correction grades = >85% and >90%) respectively), borderline outcome as <6/18 – 6/60 (available and best correction =<15% and <5% respectively), and poor outcome as <6/60 (available and best correction =<5% for each type). When assessing the vision restoration benefits achieved through cataract surgery, the measurement of visual acuity with the presenting correction, if any, not best corrected measurement, is what counts because presenting vision represents the actual circumstances under which people function in day-to-day activities (Ilechie et al., 2012).

The World Health Organization (WHO) recommends that poor visual acuity (V/A < 6/60) or borderline visual acuity (V/A <6/18–6/60) following cataract surgery should not exceed more than 5% each after best available correction. Many studies reported that 30–40% of eyes undergoing cataract surgery have a postoperative BCVA less than 6/ 60, which does not meet the individual's daily visual demand in many developing countries (Markos et al., 2020). Some of the reasons given for such poor visual outcomes have included pre-existing ocular comorbidities, surgical complications, limited surgical skill, inadequate postsurgical optical correction and improper preoperative biometry measurement.6 Additional factors associated with poor visual outcomes following cataract surgery have included older age, female gender, lower education attainment, rural residence, and treatment at government hospitals or through free surgery campaigns (Matta et al., 2016).

Recent large reviews from high-income countries have shown improved quality of life after cataract surgery. Despite many developments and advancements in the surgical management of cataract, there is still significant concern regarding poor visual outcomes after cataract surgery in many developing countries. The percentage of poor visual outcomes ranges from 11.4% to as high as 44.0% (Markos et al., 2020).

AIM OF THE STUDY

The objective of the study was to evaluate the visual outcome of age-related cataract surgery and identify factors associated with patients' postoperative visual outcomes in Benghazi teaching eye hospital, Benghazi university, Libya.

PATIENTS AND METHODS

This retrospective study was performed in the department of ophthalmology, Benghazi university during the period from December 2023 to March 2024 (4 months) on 40 patients over 40 years who underwent cataract surgery during the study period. Data were collected from medical records on age, gender and visual acuity.

The study was approved by the research ethical committee of Faculty of Medicine, Benghazi University (Institutional review board).

Only age-related cataract surgery records of patients aged 40 to 60 years wereincluded in the study. were diagnosed with a visually significant cataract and performed surgery cataract during the study period.

Patients with traumatic cataracts and those who had cataract surgery for cosmetic reasons were excluded from the study. These patients were excluded because they already had poor prognosis for vision prior to surgery.

A simple recording form was developed to record the following: age, sex, visual acuity as the patient presented on examination. Levels of visual acuity after cataract surgery were categorised using the WHO guidelines—that is, good outcome was defined as 6/6–6/18, borderline outcome as <6/18–6/60, and poor outcome as <6/60.

The surgical procedure for all eligible study participants was done by senior ophthalmologists. All patients examined for cataract surgery received a comprehensive ophthalmic examination. The standard preoperative examination included a detailed history, measurements of presenting visual acuity (PVA) and best corrected visual acuity (BCVA) using auto-refractometer (Topcon KR-800, Topcon Corporation, Tokyo, Japan).

The postoperative evaluations were performed by the surgeon who operated the case. The main outcome was best-corrected visual acuity in the operated eye, measured one week before surgery and after 3 months after surgery.

Socio-demographic characteristics, medical history, pre-operative ocular findings, and intraoperative and post-operative complications related to cataract surgery were collected from selected patients' medical records.

Statistical analysis

The readings were recorded on a data sheet of every individual and all data were collected, tabulated and statistically analyzed using SPSS 26.0 for windows (SPSS Inc., Chicago, IL, USA). Quantitative data were expressed as the mean ± SD & range, and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). t (student 't) test was used to compare between two groups of normally distributed variables. Percent of categorical variables were compared using Chi-square test. All tests were two sided. p-value < 0.05 was considered statistically significant p-value ≥ 0.05 was considered statistically insignificant.

RESULTS

Table 1: Demographic data distribution of the study patients.

Variables	No.	%
Age group		
40-50	14	35
51-60	26	65
Mean age	56 ± 4.3	
Gender		
Male	22	55
Female	18	45
Operated Eye		
Right	20	50
Left	20	50
Preoperative Comorbidities in Eye Undergoing Surgery		
Normal	22	55
Diabetic retinopathy	12	30
Corneal scar	1	2.5
degeneration	1	2.5
Retinal disease	2	5
Glaucoma	2	5

Table 1 showed the demographic and characteristics of patients included in the study, they were 22 (55%) males and 18 (45%) females. The mean age was 56 ± 4.3, the high percent of cataract was in the older age group (51-60, 35%). Preoperative Comorbidities in operated eye was present in 18 patients (45%).

Table 2: Systemic co-morbidities distribution among the study Patients.

Comorbidities	No.	%
Normal	10	25
Diabetes Mellitus	18	45
Hypertension	6	15
Cardiac Disease	4	10
Bronchial Asthma	2	5

Table 2 showed the systemic co-morbidities distribution among the study patients, Diabetes Mellitus was recorded in 18 patients (45%), Hypertension in 6 patients (15%), Cardiac Disease in 4 patients (10%) and Bronchial Asthma in 2 patients (5%) while 10 patients (25%) were without accompanied comorbidities.

Table 3: Preoperative Visual acuity distribution of the study patients.

Variables	40-50	51-60	total	Percentage%
6/6-6/18	**4**	**2**	**6**	**15**
6/24-6/60	**3**	**6**	**9**	**22.5**
<6/60	**7**	**18**	**25**	**62.5**

Table 3 showed the Preoperative Visual acuity distribution of the study patients, there were only 6 patients (15%) with good visual Acuity (6/6- 6/18) there were where 25 patients (62.5%) were poor visual Acuity (<6/60), most of the age group (<6/60).When comparing patients aged 40–50 years to those aged 51-60 years, the likelihood of a poor visual outcome was greater in older patients. Since people get older, their cataracts become denser, making it difficult to see details of the posterior segment.

Table 4: Visual acuity post operative and at follow-up visits.

Variables	Preoperative no. (%)	Postoperative after 1 week no. (%)	Postoperative after 3 months no. (%)
6/6-6/18	**6 (15)**	**33 (82.5)**	**36 (90)**
6/24-6/60	**9 (22.5)**	**4 (10)**	**3 (7.5)**
<6/60	**25 (62.5)**	**3 (7.5)**	**1 (2.5)**

Table 4 showed the pre-operative visual acuity and outcome of cataract surgeries at different follow-up visit. At 3 months follow-up visit, 36 patients (90%) had good outcome, those with less than 6/60 were only one patient (2.5%) Therefore a longer postoperative period allows for better optimal results.

Table 5: Surgical Complications (N=40).

Variable	Frequency (%)
Early surgical complications	
No complications	35 (87.5)
Cornea oedema	2 (5)
Hyphema	1 (2.5)
High IOP	1 (2.5)
Conjunctival injection	1 (2.5)
Late surgical complications	
No of complications	38 (95)
Vitreous loss	1 (2.5)
Macular oedema	1 (2.5)

Early surgical complications occurred in only 5 patients (12.5%) eyes. The most common early post operative complication that occurred in 2 patients (54%) eyes was cornea edema, while last surgical complications occurred only in 2 patients (Vitreous loss and Macular oedema).

DISCUSSION

According to WHO database; cataract surgery is one among the foremost commonly performed ophthalmic surgeries worldwide, and its frequency will increase due to environmental and lifestyle changes in upcoming years. As cataract technique and technology advances, one has to demonstrate improving outcomes (Yangzes et al., 2019).

It is frequently reported that cataract surgery is a high-volume operation because of high prevalence of cataract and limited alternatives for interventions. Cataract surgery is the only option to restore and rehabilitate visual acuity. However, several studies reported that there are multiple factors that affect the desired surgical outcome. This is another clinical challenge besides the psycho-socioeconomic burden of the disease (Hussen et al., 2017).

Markos et al., (2020) reported that there are multiple factors associated with poor surgical outcome following cataract surgery which differ from country to country and even within the same country in different setups. Univariate logistic regression for factors associated with poor visual outcome revealed that age, preoperative ocular co-morbidities (preoperative elevated IOP, glaucoma, AMD, pseudoexfoliation), intraoperative complications and preoperative astigmatism were significantly associated with poor postoperative BCVA. Multivariate logistic regression indicated that AMD and preoperative astigmatism were significantly associated with poor visual outcome after cataract surgery.

This retrospective study was performed in the department of ophthalmology, Benghazi university during the period from December 2023 to March 2024 (4 months) on 40 patients over 40 years who underwent cataract surgery during the study period to evaluate the visual outcome of age-related cataract surgery and identify factors associated with patients' postoperative visual outcomes in Benghazi teaching eye hospital, Benghazi university, Libya.

The current study showed that the demographic and characteristics of patients included in the study, they were 22 (55%) males and 18 (45%) females. The mean age was 56 ± 4.3, the high percent of cataract was in the older age group (51-60, 35%). Preoperative Comorbidities in operated eye was present in 18 patients (45%). Simillary, Olawoye et al., (2011) found that the age distribution of the patients showed that majority were between the ages of 50 and 79 with a mean age of 65.8 years. This age distribution is in conformity with what is seen in cataract patients in many eye clinics in Nigeria.

Matta et al., (2016) fond that the mean age was 61.8 years (SD: 8.9 years) and 1,133 (55.3%) surgeries were performed on female patients. Preexisting ocular co-morbidity was present in 165 patients (8.1%).

The deference in mean age in our study with other studies because the sample of our study included only age group of 40-60 years only.

There were more males than females in this study. Several studies have found a male preponderance among cataract patients presenting to eye clinics have been shown to have a slightly increased age adjusted risk of cataract16 they do not receive cataract surgery at the same rate as men.

The current study the systemic co-morbidities distribution among the study patients, Diabetes Mellitus was recorded in 18 patients (45%), Hypertension in 6 patients (15%), Cardiac Disease in 4 patients (10%) and Bronchial Asthma in 2 patients (5%) while 10 patients (25%) were without accompanied comorbidities.

Markos et al., (2020) found that one hundred forty three (45.5%) of the patients had other ocular comorbidities and nearly one third (30.9%) had systemic diseases.

The current study the Preoperative Visual acuity distribution of the study patients, there were only 6 patients (15%) with good visual Acuity (6/6-6/18) there were where 25 patients (62.5%) were poor visual Acuity (<6/60), most of the age group (<6/60). When comparing patients aged 40–50 years to those aged 51-60 years, the likelihood of a poor visual outcome was greater in older patients. Since people get older, their cataracts become

denser, making it difficult to see details of the posterior segment.

Matta et al., (2016) fond that increasing age was found to be one of the predictor for poor outcome. It is likely that those older had a denser cataract and therefore ocular comorbidities.

The current study the pre-operative visual acuity and outcome of cataract surgeries at different follow-up visit.. At 3 months follow-up visit, 36 patients (90%) had good outcome, those with less than 6/60 were only one patient (2.5%) Therefore a longer postoperative period allows for better optimal results. A similar result was reported from the studies conducted in Jos, Nigeria (Bekibele & Fasina, 2008)), and South Ghana (Ilechie et al., 2012), in which greater amount of visual acuity change has been recognized in different consecutive weeks. This indicates that as the time increase after operation, all acute postoperative complications as in disturbances of aqueous humor, change in pupillary size, regularity, and other ocular parameter changes will be stabilized. This results in stabilization of the visual acuity. Where Hussein et al., (2017) found that around 73.4% of the cataract operated eyes were remained as visually impaired postoperatively (<6/18). Only 26.6% of cataract-operated eyes have achieved good visual acuity.

Junejo et al., (2022) found that Postoperative VA was recorded for 982 (100%) eyes. After cataract surgery, 966 (98.4%) eyes had good VA compared with pre-operative measurements. There have been 16(1.6%) eyes of patients who's VA was moderate.

Markos et al., (2020) found that after the mean follow-up period was 7.5 weeks (range, 6–8 weeks), there was a significant improvement in vision after surgery (p=0.01) in a majority of the study participants. At the final visit, a good visual outcome was achieved in 61.1% and 68.5% of patients before and after best correction, respectively.

Matta et al., (2016) fond that One hundred and seventy eight patients (8.6%) missed the 1–3 week follow-up visit and 608 (29.7%) missed the 4–11 weeks follow-up visit. At 4–11 weeks follow-up visit, based on PVA, 61.8% had good outcome and based on BCVA, 91.7% had good outcome. Based on PVA and BCVA, those with less than 6/60 were only 2.9% and 1.6% respectively.

The outcomes in our study were generally better than those from a study in India, where fair outcomes were achieved in only 50% of cases (Domple et al., 2011) and also compared to a study from Nepal, where good, borderline and poor visual outcomes were found in 41.3%, 45%, and 13.7%, respectively (Kumar et al., 2012).

Hashmi et al., (2013) showed that visual outcome in most of the operated eyes was good. Only around 7% of operated eyes had borderline or poor visual outcomes, the cause of which was mainly pre -existing ophthalmic comorbidities such as diabetic retinopathy, glaucoma and macular disease.

The results of our study are better than those of a study conducted multi-country study which showed that 77% to 87% of the operated eyes in three developing countries achieved good outcome after correction (Lindfield et al., 2009).

Refractive errors, preoperative comorbidities and surgical complications were the reasons for poor or borderline outcomes. In a study conducted at LRBT, Lahore, Pakistan, out of a total of 176 eyes that underwent cataract surgery, 69.9% had good visual outcome after correction, while 17.6% had borderline and 12.5% had poor outcomes (Malik et al., 2003).

The current study Early surgical complications occurred in only 5 patients (12.5%) eyes. The most common early post operative complication that occurred in 2 patients (54%) eyes was cornea edema, while last surgical complications occurred only in 2 patients (Vitreous loss and Macular oedema).

Ilechie ei al., (2012) reported that early surgical complications occurred in only 130 (10.1%) eyes. The most common early post operative complication that occurred in 44 (3.4%) eyes was cornea edema. Hyphema was the second most common early complication which occurred in 28 (2.2%) eyes.

Junejo et al., (2022) found that the most common reason for moderate BCVA was posterior capsule rupture and cystoids macular oedema.

Markos et al., (2020) found that two hundred thirty seven (75.5%) patients experienced one or more complications in the immediate postoperative period. The complications include striate keratopathy in 153 (48.7%), corneal edema in 115 (36.6%), raised IOP in 126 (42.3%) and hyphema in 19 (6.10) patients.

Our results is comparable with the study done by Patil et al., (2016) in India, where the rate of postoperative complications were 22 (8.8%) cases. This also falls in line with a study done by Gogate et al., (2003) in western India, where intraoperative complications were seen in 8.1% of cases and moderate to severe complications like posterior capsular rent and vitreous loss were seen in 5.02% of surgeries.

CONCLUSION

This study shows good visual outcome of cataract surgeries performed in Libya. There is a potential for excellent surgical outcome in Libya if more attention is paid to uncorrected refractive error. The study highlights

the need for improved post-operative visual monitoring after cataract surgery in Libya.

The importance of monitoring visual outcome cannot be overemphasized as it helps surgeons find ways of improving their surgical skills. It is also important to do preoperative biometry for all patients in order to ensure better vision post-operatively.

Further studies of a larger sample size and taking into consideration risk factors that are related to poor outcome are recommended.

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