

## Original article

# Cataract surgery in camp patients: a study on visual outcomes

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### Abstract

**Aim:** To assess the complications and visual outcomes associated with cataract surgery in camp patients operated at a tertiary centre.

**Materials and methods:** In a retrospective study, 206 outreach camp patients had undergone cataract surgeries with posterior chamber intraocular lens implantation under peribulbar anesthesia over a period of 6 months. Post-operative complications on Day 1 were graded as per Oxford Cataract Treatment and Evaluation Team (OCTET) definitions. One month post-operative complications, best corrected visual acuity and refractive errors were assessed.

**Results:** 206 eyes underwent cataract extraction with PCIOL implantation. Small incision cataract surgery (SICS) was the commonest method (78.6%) used. The most common first post-operative day complication was mild iridocyclitis (26.2%). The complications were based on OCTET definitions, and showed that 33 % had Grade I and 3.4 % had Grade II complications. The major post-operative complication after 4 weeks of surgery was posterior capsular opacity. 89.8 % of the eyes had a 4 week-post-operative best corrected visual acuity of e' 6/24. The commonest refractive error was myopia with against the rule astigmatism, seen in 86 out of 150 cases.

**Conclusion:** High quality cataract surgery with a low rate of intra-operative complications and good visual outcome can be attained in camp patients operated in the base hospitals, thus justifying more similar screening camps to clear the vast cataract backlog.

**Key words:** cataract surgery, eye camp, visual outcomes

### Introduction

Cataract is the main cause of avoidable blindness worldwide, with the developing world accounting for three quarters of this. In 1997, approximately 10 million cataract surgeries were performed globally but despite this, cataract blindness is thought to be increasing by 1 – 2 million per year. To address this increasing backlog, significant progress is being made in increasing the output of cataract surgical services in many developing countries. Cataract

blindness is particularly important in India, and remains the leading cause of blindness (Vijaya et al 2006, Murthy et al 2005, Thulisiraj 2003, Dandona et al 2001), where 81 % of severe visual impairment is due to cataract with an estimated 3.8 million people getting affected annually.

The main emphasis of the National Program for Control of Blindness (NPCB) in India was on cataract blindness control (Jose et al 1995). As a result, the number of cataract surgeries performed increased from 1.2 million/year in 1992 to 3.86 million/year in the year 2003 (National Programme

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for Control of Blindness, India, 2003). In the “Vision 2020: The Right to Sight” initiative, the target was to perform 21.1 million cataract surgeries during 2002-07 with 80% intraocular lens implantation (National Programme for Control of Blindness, India (2004). Even though the cataract surgical targets are being met, poor outcomes of cataract surgery is a major problem in developing countries (Dandona et al 1999, Murthy et al 2001, Nirmalan et al 2002, Anand et al 2000). This study was carried out with an objective to assess the complications and visual outcomes associated with cataract surgery in camp patients operated at a tertiary centre.

**Materials and methods**

This retrospective study was conducted at the Ophthalmology Department of KMC hospital, Mangalore. The study was approved by the Institutional Ethics Review Board. 206 patients who were screened at the community based camps and then transported to the base hospital, i.e. KMC Hospital, for the complete ophthalmic examination and cataract surgery were included in the study. The inclusion criteria were senile or acquired cataract, without any associated co-morbidity either systemic or ocular. The best-corrected visual acuity (BCVA) was measured using the Snellen’s and E – charts. If the visual acuity could not be measured, we checked the following sequentially: counting fingers, hand movements and light perception. The type and grading of lens opacities was done by LOCS III. A detailed posterior segment and retinal examination was done by direct/indirect ophthalmoscopy. IOP was measured with Goldmann’s applanation tonometer. Blood pressure and urine sugar were checked to rule out systemic hypertension and overt diabetes respectively. IOL power was calculated by keratometry and A scan biometry for all patients.

Information regarding the technique of surgery, the first day and late post-operative complications after 4 weeks of surgery, and the post-operative visual acuity were recorded, and the results analyzed. The first post operative day (POD) complications were

graded according to the OCTET ( Oxford Cataract Treatment and Evaluation Team) definitions: Grade I- trivial complications that may have needed medical therapy but were not likely to result in marked drop in visual acuity; Grade II - intermediate complications that needed medical therapy, and would have resulted in marked drop in visual acuity if left untreated; Grade III - serious complications that would have needed immediate medical or surgical intervention to prevent gross visual loss.<sup>12</sup>

**Results**

Among the 206 patients, 120 were males (58.2 %) and 86 females (41.7 %). The maximum patients (43.7 %) were in the age group of 60 - 69 years (Table 1).

**Table 1**  
**Distribution of patients with cataract in various age groups**

Age group	No. of patients with cataract
30-39	2
40-49	16
50-59	46
60-69	90
70-79	38
80-89	14

396 eyes of 206 patients had cataract, of which 298 had the cortical type (75.3 %) and 98 had the nuclear type (24.7 %). Of the cortical type, 214 were immature and 84 mature cataracts. Among the nuclear type, 22 were NS grade I, 52 NS grade II, 20 NS grade III, and 4 eyes with NS grade IV (Table 2).

**Table 2**  
**Types of cataracts**

Cortical = 298		Nuclear sclerosis = 98	
Immature	214	Grade 1	22
		Grade 2	52
Mature	84	Grade 3	20
		Grade 4	4



206 eyes underwent cataract extraction with PCIOL implantation. Small incision cataract surgery (SICS) was the commonest method used (162 cases, 78.6 %), followed by 28 cases (13.6 %) of phacoemulsification and 16 cases (7.8 %) of extra capsular cataract extraction (ECCE). No eye was left aphakic.

The first post-operative day complications (Table 3) showed that a major percentage (26.2 %, 54 eyes) suffered from mild iridocyclitis followed by transient corneal edema (20.9 %, 43 eyes), and striate keratopathy (12 %, 25 eyes). The complications based on OCTET definitions showed that 68 eyes (33 %) had Grade I, 7 eyes (3.4 %) had Grade II and 2 eyes had Grade III complications. 59 eyes had more than one complication.

The major post-operative complications after 4 weeks of cataract surgery (Table 4) was posterior capsular opacity (PCO) seen in 16 cases (7.8 %), followed by pigments on PCIOL in 9 cases and capsular flap in 6 cases.

185 cases (89.8 %) had a four-week post-operative BCVA of e'' 6/24, 16 cases had 6/36 – 6/60, and 5 had < 6/60. Among the 150 patients with refractive errors (Table 5), the commonest error was myopia with against the rule astigmatism seen in 86 cases (41.7 %).

**Table 3**

**First post-operative day complications**

Type of refractive error	No. of eyes (%)		
Simple myopia	15 (7.3%)	OCTET grading of 1 <sup>st</sup> (70) complications	
Myopia + with the rule astigmatism	24 (11.7%)		
Myopia + against the rule astigmatism	89 (43%)		
Hypermetropia + with the rule astigmatism	5 (3.4%)		
Hypermetropia + against the rule astigmatism	21 (10.2%)		
Total	60 (29.3%)		
Mild iritis <50 cells in 2x1mm slit beam	54 (26.2%)		Grade I
Transient corneal edema	43 (21.1%)		
Striate keratopathy	25 (12%)		
Hyphaema <2mm	5 (2.4%)		
Subconjunctival haemorrhage	3 (1.5%)		
Severe iritis >50 cells in 2x1mm slit beam	4 (1.9%)		
Iris in wound	2 (1%)		
Shallow AC	1 (0.5%)	Grade III	
Descemet's detachment	2 (1%)		

**Table 4**

**One month post-op BCVA**

BCVA	No. of patients
6/6	74
6/9	55
6/12	37
6/18	14
6/24	5
6/36	10
6/60	6
<6/60	5

**Table 5**

**Types of post-operative refractive errors**


## Discussion

The annual output of cataract intervention program is measured only in terms of number and the qualitative aspect is very often ignored. The indicator commonly used to measure the qualitative output is the success rate, i.e., the percentage of operations that result in restoration of sight in the operated eye in a particular year (Anand et al 2000). Cataract surgery is the most commonly performed operation in the NHS with more than 270,000 performed in England in 2002 – 2003 (Johnston et al 2005).

It is important to monitor the results of changes in surgical technique and the management of post-operative complications adequately, to bring about a marked improvement in the quality of visual outcome following a cataract surgery.

The majority of the patients operated in the study were in the age group of 60 - 69 years, similar to the study of Parul Desai et al wherein 80 % of patients were above 70 years of age. Old age itself was associated with poor visual outcome after adjusting for presence of age-related and coexisting eye disorders such as age-related macular disease (Dessai et al 1999). According to Westcott et al, the impact of age on visual acuity outcome is illustrated by the odds ratio which indicates that the odds of achieving > 6/12 vision for the youngest age group is 4.6 times higher than that for the oldest (80+ years) age group (Westcott et al 2000). Male patients were likely to have a risk of achieving BCVA < 6/18 according to the study done by Muralikrishna et al which included 318 female patients (54 %) and 275 male patients (46%) (Venkatesh et al 2005).

In the present study, the maximum number of surgeries done was SICS (78.6 %), well consistent with the work of Bourne et al which states that the ratio of ICCE: ECCE + IOL has reduced significantly. It also supports an increasing trend towards ECCE with PCIOL in the developing

countries following the example of the developed countries ((Bourne et al 2003). Good visual results are possible after SICS/ECCE with IOL and phaco with IOL in the developing world (Malik et al 2003). However, despite excellent facilities and skilled surgeons, the poor are deprived of the visual benefit of IOLs, mainly because of their inability to afford them. It is, therefore, important that affordable IOLs of good quality are made widely available, with cost sharing or cross subsidy, so that IOLs are available to all irrespective of their ability to pay (Malik et al 2003).

The first POD complications of our study can be compared with that of Venkat esh et al (2005) who also used the OCTET grading and analyzed that 55 patients had Grade I, 19 patients (3.2 %) had Grade II, and 1 patient (0.2 %) had Grade III complications. The variability among surgeons regarding complications has been reported elsewhere and is probably unavoidable.

Mild iridocyclitis (26.2 %) was the commonest first POD complication, followed by transient corneal edema (20.9 %), and striate keratopathy (12 %), unlike in the study by Desai P wherein the most common complication was corneal edema (9.5 %), followed by raised IOP (7.9 %) and uveitis (5.6 %) (Dessai et al 1999). No case of endophthalmitis was encountered in our study, which correlated well with the study of Le Mesurier wherein the incidence of endophthalmitis was very low (0.03 %) (Kapoor et al 1999). According to the National Cataract Surgery Survey (Desai 1993), the potentially devastating complications like endophthalmitis are sufficiently rare that they are more appropriately defined as sentinel events. The post-operative complications may cause discomfort and extended

hospitalization or other increased use of resources which may lead to an overall poor outcome.

Visual outcomes for cataract surgery are reported as the achievement of a defined level of Snellen acuity (6/12 or better in the operated eye) at two points in time during the post-operative recovery process: at time of discharge from hospital and at the final refraction performed within 3 months of surgery. Levels of visual acuity after cataract surgery were categorized using the WHO guidelines of good outcome being 6/6 to 6/24, borderline outcome as 6/24 to 6/60 and poor outcome as <6/60 (Venkatesh et al 2005). In the present study, the majority (89.8 %) had a good outcome, 7.8 % borderline, and 5 cases had poor outcome, which implies that the visual outcome was very good and correlates well with the outcomes of various other studies (Venkatesh et al 2005, Bourne et al 2003, Malik et al 2003, Anand et al 2000, Desai et al 2000).

The results obtained from the study were almost consistent with the randomized control trial camp in India (ECCE + Manual SICS). The residual refractive error is however a major deterrent to a successful visual outcome. The visual acuity being a predictor of visual outcome when analyzed in our study showed a good outcome, as post-operative BCVA implies the effectiveness of the surgery done in the base camp compared to the surgeries done at the camp site itself.

Cataract surgery is one of the most successful surgical procedures in medicine. But complications are still implicated which range from a minor inflammation of the eye following surgery to devastating visual loss which though rare, can occur due to infection, bleeding in the eye or retinal detachment. More than 98 % of patients do not suffer surgical complications and more than 95 % have improved vision (Lawrence et al 1999). Poorer visual outcome is usually predicted by older age, poor preoperative visual acuity and coexisting ocular comorbidity (Norregaard et al 1998).

## Conclusion

Our study shows that high quality cataract surgery with a low intra-operative complication rate and good visual outcome can be attained even in camp patients operated in the base hospitals. A good choice of surgical technique, trained surgeons and paramedical personnel and good organizational setup can better the visual outcome even in high-volume camp patients. This can help us to decrease the backlog of cataract blindness by conducting cataract screening camps and giving them high quality surgical care at a base hospital.

## References

- Anand R, Gupta A, Ram J, Singh U, Kumar R (2000). Visual outcome following cataract surgery in rural punjab. *Indian J Ophthalmol*; 48 (2):153-8.
- Bourne RRA, Dineen BP, Ali SM, Noorul Huq DM and Johnson GJ (2003). Outcomes of cataract surgery in Bangladesh: results from a population based nationwide survey. *Br J Ophthalmol*; 87(7):813-9.
- Dandona L, Dandona R, Naduvilath TJ, McCarty CA, Mandal P, Srinivas M *et al* (1999). Population based assessment of the outcome of cataract surgery in an urban population of southern India. *Am J Ophthalmol* ; 127(6):650-8.
- Dandona L, Dandona R, Srinivas M, Giridhar P, Vilas K, Prasad MN *et al* (2001). Blindness in the Indian state of Andhra Pradesh. *Invest Ophthalmol Vis Sci* ;42 (5):908-16
- Desai P, Minassian DC, Reidy A (1999). National cataract surgery survey 1997-8: a report of the results of the clinical outcomes. *J Ophthalmol*; 83(4):1336-1340.
- Desai P, Minassian DC, Reidy A (1999). Profile of patients presenting for cataract surgery in the UK:national data collection. *Br J Ophthalmol*; 83 (8):893-6.
- Johnston RL, Sparrow JM, Canning CR, Tole D and Price NC (2005). UK Cataract EPR users group Pilot National Electronic Cataract Surgery

Survey: I. Method, descriptive, and process features Eye; 19 (7):788-794.

Jose R, Bachani D (1995). World Bank assisted cataract blindness control project. Indian J Ophthalmol ;43(1):35-43.

Kapoor H, Chatterjee A, Daniel R, Foster A (1999). Evaluation of visual outcome of cataract surgery in an Indian eye camp. Br J Ophthalmol; 83(3):343-346.

Lawrence DJ, Brogan C, Benjamin L, Pickard D, Stewart-Brown S (1999). Measuring the effectiveness of cataract surgery: the reliability and validity of a visual function outcomes instrument .Br J Ophthalmol; 83(1):66-70.

Malik AR, Qazi ZA and Gilbert C (2003). Visual outcome after high volume cataract surgery in Pakistan. Br J Ophthalmol; 87(8):937-940.

McKellar MJ, Elder MJ (2001). The early complications of cataract surgery: is routine review of patients 1 week after cataract extraction necessary? Ophthalmology; 108(5):930-5.

Murthy GVS, Ellwein LB, Gupta S, Thanikachalam K, Ray M, Dada VK (2001). A population based eye survey of older adults in a rural district of Rajasthan: II. Outcomes of cataract surgery. Ophthalmology;108(4):686 -92.

Murthy GVS, Gupta SK, Bachani D, Jose R, John N (2005). Current estimates of blindness in India. Br J Ophthalmol; 89 (3):257-60.

National Programme for Control of Blindness, India (2003). Performance of cataract surgery between April2002 and March 2003, National Programme for Control of Blindness-India, Quarterly Newsletter; 2:2.

National Programme for Control of Blindness,India (2004). Revised pattern of assistance under NPCB, National Programme for Control of Blindness-India, Quarterly Newsletter; 3:2.

Nirmalan PK, Thulasiraj RD, Maneksha V, Rahmathullah R, Ramakrishnan R, Padmavathi A et al (2002). A population based eye survey of older adults in Tirunelveli district of south India: Blindness, cataract surgery and visual outcomes. Br J Ophthalmol; 86(5):505-12.

Norregaard JC, Hindsberger C, Alonso J, Bellan L, Bernth-Petersen P, Black C, Dunn E, Andersen TF, Espallargues M, Anderson GF (1998). Visual Outcomes of Cataract Surgery in the United States, Canada, Denmark, and Spain Report from the International Cataract Surgery Outcomes Study. Arc Ophthalmol; 116(8):1095-1100.

Oxford Cataract Treatment and Evaluation Team (1986).Use of grading system in evaluation of complications in a randomized control trial.Br J Ophthalmol; 70 (6):411-414.

Thulisiraj RD, Nirmalan PK, Ramakrishnan R, Krishnadas R, Manimekalai TK, Bapurajan NP (2003). Blindness and vision impairment in a rural south Indian population: The Aravind Comprehensive Eye Survey. Ophthalmology; 110 (8):1491-98.

Venkatesh R, Muralikrishnan R, Balent LC, Prakash SK, Prajna NV (2005). Outcomes of high volume cataract surgeries in a developing country Br J Ophthalmol;89: (9)1079-1083.

Vijaya L, George R, Arvind H, Baskaran M, Raju P, Ramesh SV et al (2006). Prevalence and causes of blindness in a rural south Indian population. Br J Ophthalmol; 90 (4):407-10.

Westcott MC, Tuft SJ, Minassian DC (2000). Effect of age on visual outcome following cataract extraction . Br J Ophthalmology; 84 (12):1380-1382.

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