Visual outcome in outreach eye camp cataract surgery and its complications in Northeast India

Rajkumari Vidyarani Devi[1,*], Kamson Anthony[2], Meirenbam Ranjana[3]

[1]Associate Professor, [2]Assistant Professor, [3]Senior Resident, Dept. of Ophthalmology, JN Institute of Medical Sciences, Manipur, India

***Corresponding Author:**
Email: drvidya777@gmail.com

Abstract

Aims: To evaluate postoperative vision-outcomes and demography of cataract from different outreach camp conducted in northeastern part of India.

Materials and Methods: The cases were selected from 31 different outreach camps conducted in northeast India mainly in Manipur and adjoining states between 2013 and 2015. Total of 11240 patients was screened and cataract was detected in 2182 patient. 41% were Male while female constitute 59% and most of them were between 60-70 years and surgery was done at the Base hospital. Majority (60%) of the patients underwent SICS and in remaining 39% was phacoemulsification performed.

Results: The final best corrected visual acuity of 6/6 was achieved in (63.9%) and visual acuity between 6/12 to 6/18 in 629 (28.8%) cases, 6/24 to 6/36 in 150 (6.8%) and <6/60 in 11 (0.5%) cases.

Conclusion: The overall visual outcome was excellent with a very low rate of complication. SICS remain the procedure of choice for cataract surgery for such remote areas with limited facilities. Multiple outreach camp is the need of the hour to reduce visual handicap and improve quality of life in this regions.

Keywords: Cataract, Eye camp, Phacoemulsification, Outreach, Visual acuity.

Introduction

Cataract surgery is the most cost effective means of tackling blindness or visual impairment due to cataract. NPCB encourages outreach eye camp in remote areas to reduce the prevalence of blindness from 1.4% to 0.3% by 2020.[8] North eastern states in India is mainly populated by Sino-Tibetan group of mongoloid origin. Because of its geographical location and tough terrain eye care services do not reach the population effectively creating a huge barrier in our goal. Outreach camps with high-volume surgery at the base hospital approach is considered more reliable in providing optimal visual rehabilitation compared to peripheral eye camps.[5-7]

Materials and Methods

The cross-sectional study includes cataract cases selected from 31 different outreach camps conducted at different part of Northeast India mainly Manipur and adjoining sister states between 2013 and 2015. Approval for the study was taken from the institutional departmental committee. A total of 11240 patients attended the free eye camp and of that 3100 patients was detected for cataract out of which 2182 patients turned up for operation. Assessment of eye includes pre-operative visual status, diagnosis and condition of the contralateral eye by slit lamp examination, age, gender, locality and ethnicity were recorded prospectively and history of any systemic or metabolic illness were also recorded. Inclusion criteria were immature cataract, senile cataract and hypermature cataract and exclusion criteria were congenital and complicated cataract. Preoperative evaluation consists of slit lamp examination, examination of fundus, IOP, random blood sugar with glucometer and lacrimal sac syringing was done. Keratometry readings were taken, A-scan for axial length and biometry was done to determine intraocular lens (IOL) power.

The cataract cases were then brought up from the camps and operated at our institute. Small incision cataract surgery SICS was performed on 1326 (60.7%) patient and phacoemulsification on 856 (39.2%) patients and intraoperative complications was recorded. The patients were then examined on the first post-operative day 1, then after 1 week, then finally after 6 weeks for visual acuity and refractive correction and cause of poor outcome were recorded and statistical analysis was done using percentage and graphical presentation. Post-operative visual status was graded (based on the WHO recommendations for acceptable outcomes) into good if it was 6/18 or better, borderline if <6/18–6/60, and poor outcome if <6/60, using Snellen visual acuity charts. For better analysis WHO classification is again subdivided into Excellent (6/6-6/9), good (6/12-6/18), fair (6/24-6/36), poor (6/60) and very poor (<6/60). Sight restoration rate (SRR) is defined as:[13] Persons blind preoperatively VA < 3/60) - Persons blind postoperatively × 100.

Results

A total of 2182 patient were operated within a period of two years. Male constituted about 895 (41%) in numbers and female constituted 1289 (59%) in numbers. Table 1

Table 1: No of cataract surgery performed (2013-2015)

Total No of Patient attended	**11240**	
No of cataract surgery	2182	(19.4%)
No of Male	895	(41%)
No of Female	1289	(59%)

The ages of the patients ranged from 40 to 100 years with a mean of 65 years. 804 (36.8%) patients were between 60-70 years of age followed by 599 (27.5%) cases between 70-80 years, 368 (16.9%) cases between 50-60 years, 284 (13%) cases between 80-90 years, 115 (5.3%) cases were <50 years and 12 (0.5%) cases were above 90 years there were 895 males (41%) and 1289 (59%) females. Table 1 presents the demographic characteristics of the patients.

Table 2: Age distribution of cataract surgery

Age	**No of Patient**	**Percentage**
<50	115	5.27 %
50-60	368	16.8 %
60-70	804	36.8 %
70-80	599	27.5 %
80-90	284	13 %
>90	12	0.5 %

Preoperative vision revealed that 694 patients had a visual acuity of between 6/60 – 3/60. 763 had visual impairment of 3/60. While 427 had finger counting and 298 had perception of light. Table 3 presents the preoperative vision.

Table 3: Pre-operative visual assessment

Vision	**No of Patients**	**Percentage**
6/60-3/60	694	32 %
>3/60-FC	763	35 %
HM	427	20 %
PL	298	14 %

Cataract is divided into different grades; NC grade III is seen in 623 (28%) cases, NC grade IV in 368 (16%) cases, mature cataract in 674 (30%) cases and hypermature cataract in 516 (23%) cases. Systemic disorder like diabetes is found in 207 patients, hypertensions in 110, pacemaker in 7, thyroid disorder and others in 5 patients.

At six weeks postoperatively, the uncorrected visual acuity showed that 621 patients (28.4%) had good vision (6/9 and better) while 794 patients (36.3%) had a vision (6/12 – 6/18). 518 patients (23.7%) had a border line vision of (6/24 -6/36) severe visual impairment of 6/60 is seen in 49 patients (2.2%) and 20 patients had vision <6/60 (1%). Table 4 shows the post-operative visual outcome.

Table 4: Visual Outcome

Vision	**UCVA**	**BCVA**	
6/6-6/9	621 (28.4%)	1396(63.9%)	Excellent
6/12-6/18	794 (36.3%)	629 (28.8%)	Good
6/24-6/36	518 (23.7%)	150 (6.8%)	Fair
6/60	49 (2.2%)		Poor
< 6/60	20 (<1%)	11 (0.5%)	Very Poor

After proper corrective glasses, 1396 cases (63.9%) had a good visual acuity of 6/6, 629 (28.8%) cases had acuity between 6/12 to 6/18, 150 (6.8%) cases had a borderline acuity of 6/36 or better and the remaining 11 patients (0.5%) cases had poor vision < 6/60 despite refraction. Table 5 shows visual outcome as per WHO.

Table 5: Visual outcome as per WHO

Vison	**Grade**	**%**
>6/18	Good	2025 (92%)
6/18-6/60	Borderline	150 (6.8%)
<6/60	poor	20 (0.9%)

Intraoperative complication which was some of the reason for poor vision was seen in 44 (2%) cases. DM striping was seen in 5 patients (0.22%), corneal wound leakage in 4 patients (0.18%), button hole in 7 patients (0.32%), premature entry in 12 patients (0.54%), PCR in 11 patients (0.5%), iridodylysis in 3 patients (0.13%) and zonular dialysis in 2 patients (0.09%). Table 6 shows intraoperative complication.

Table 6: Intraoperative complication

DM Striping	5	0.22%
Corneal wound related	4	0.18%
Button Hole	7	0.32%
Premature Entry	12	0.54%
PCR	11	0.5%
Iridodialysis	3	0.13%
Zonular dialysis	2	0.09%

Discussion

Cataract surgery aims to rehabilitate blind or visually impaired persons. The outcome of cataract surgery for an individual or for a defined population is therefore as important as measuring the quantity of surgical operations performed and the number of eye rehabilitated. There has been a tremendous increase in CSR in India due to the intensive outreach eye care service with the inception of the world bank-supported cataract blindness control project.[12] Many states in the country have already crossed CSR of 3000 by 2000 as targeted under vision 2020. [9]

Our responsibility increases with the increased volume of cataract surgery every year. Rehabilitating the visually impaired is the aim of cataract surgery so, when we talk of quantity is also important to take into account the quality or outcome of the surgery. The

standards proposed by the World Health Organization (WHO) (more than 85% of operated eyes should have >6/18 vision at six weeks following cataract surgery.[11] In our study the visual outcome was excellent with most patients achieving BCVA of > 6/18 post operatively at 6 weeks after undergoing proper refractive correction. 92 % of the patient had a good vision of > 6/18 fulfilling the standards proposed by WHO. While some of the other studies had a low visual acuity after cataract surgery higher than WHO recommended (<5%) due to un corrected refractive error.[3,14] Huge difference in visual acuity is seen in vision >6/18 in uncorrected (64%) and BCVA (92%). This highlights the importance of correcting the refractive errors after every successful cataract surgery which is also supported by Dandona L et al, Suraj Senjam et al.[3,4,16] Standard IOL power implanted without biometry in cataract eye camps was also one of the reasons for poor post-operative refractive outcome. Briesen H et al.[17] encounter poor refractive outcome in 20% of patients implanted IOL without biometry. Proper biometry in every camp patient with implantation of appropriate IOL power is very important in improving refractive outcomes after cataract surgery along with a good surgical technique.

Diabetes mellitus and systemic hypertension are the commonly encounter systemic problem in the cataract patient who is mostly above 60 years.

BCVA at 6 month follow-up was between 6/6 - 6/9 in 1396 (63.9%) patient, 6/12 - 6/18 in 629(28.8%), 6/24 and 6/36 in 150(6.8%), 6/60 in 49(2.2%), <6/60 in 11(0.5%). J Sudhakar et al.[19] in 1989 in their study had achievd a BCVA of 6/9 of better in 57.1%. Another group Venkatesh et al.[15] in 2005 in their study achieved BCVA of 6/18 or better in 94.4%. Ravindra et al.[14] in 1996 reported a BCVA of 6/18 or better in 80.7%. Similarly, Hennig et al. [20] in their study reported a BCVA of 6/18 or better in 96.2% and 88.3% respectively. Kapoor et al.[21] in 1999 reported 79.9% eyes obtained 6/18 or better vision. Sushma A Hosamani et al.[22] in 2014 achieved BCVA of 6/12 and even better in 141 (86.1%). But Jing yuan et al.[23] in 2015 had BCVA > 6/18 in only 69.5%, which attribute intraoperative complication to be the cause of poor visual outcome.

Our studies achieved BCVA of 6/18 or better in 92.7% of the patients. Some limitation is that we could compare the BCVA better than 6/12 because all the other study follow WHO criteria which take >6/18 as cutoff visual acuity.

Good surgical technique and better patient management pre and postoperative have overall reduce the complication hence increasing the final visual acuity. We encountered intra operative complication in 44 (2%) cases. Venkatesh et al.[15] in 2003 reported an incidence of 1.9% of intraoperative complications which is comparable to our study of which PCR and premature entry were the main complication. Premature entry was the most frequent intraoperative complication in our study increasing the surgical time due to frequent iris prolapse. Thus, a proper scleral tunnel is very important to prevent iris prolapse. The second most encountered complication was posterior capsule rupture with vitreous loss which requires timely identification and management otherwise it can lead to irreversible poor post-operative outcome.

Except PCR and zonular dialysis other complication does not affect the final visual outcome of the patient. Dandona et al in 1999.[16] Posterior segment complications were the main cataract surgery-related cause of blindness. Surgeon's experience is likely to be one of the important factors in reducing intra operative complication and the final outcome as studied by Anand R et al.[18] The study results by Venkatesh et al.[15] showed that high quality cataract surgery (94% BCVA 6/18 or better) can be attained in a high volume setting.

Conclusion

Visual outcome were excellent with most patient achieving BCVA of 6/9 and better post operatively with a very minimal complication. SICS remain the procedure of choice for cataract surgery for such remote areas with limited facilities and high caseloads. Multiple outreach camp is the need of the hour to reduce visual handicap and improve quality of life in this regions. Thorough preoperative assessment standardizes surgical technique, postoperative monitoring are the key to provide quality vision after a cataract surgery. Such measures will be a contribution in the efforts of India's goal of bringing the prevalence of cataract blindness to < 0.3 by 2020.

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