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Efficacy of rural camps in achieving vision 2020: Our contribution

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ABSTRACT

Aim: To assess the effectiveness of rural camps held under DBCS (District Blindness Control Programme) & compare the results of cataract surgery at base hospital cases.

Materials and Methods: It is a retrospective observational study, medical records of patients operated for cataract in camp & patients operated in base hospital are analyzed.

In our hospital outpatient department, we saw 2,08,716 patients from 2010-2019 and 7796 underwent cataract surgery. Under DBCS we conducted 262 camps from 2010-2019 & 4611 underwent cataract surgery.

Results: A total of 27,524 patients got screened in 262 rural camps and 4671 underwent small incision cataract surgery at the base hospital after detailed clinical examination and IOL (intraocular lens) power calculation for each patient. Among 2,08,716 outpatients at the base hospital, 7796 underwent cataract surgery. The rate of intraoperative complications in the base hospital was 0.885% whereas in camp cases 1.94%. IOL implantation is done in 100% cases in base hospital surgeries and 0.064% patients left aphakic among rural camps.

Conclusion: Screening at outreach camps and surgeries at the base hospital can have excellent results. Mass surgeries in camps following standard protocol can have the least number of complications.

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1. Introduction

Cataract is the most the common cause of avoidable blindness worldwide and in Indian subcontinent.¹

Vision 2020: the right to sight initiative is supported by the world bank for the elimination of avoidable blindness. Persistence of barriers like cost, distance, lack of awareness, and health care priorities.² Mass camps conducted in the field for screening and surgery carried out at base hospital is the acceptable model to reduce intraoperative and postoperative complications.³

We aimed to see the prevalence of cataract surgery in this area and its comparison in terms of delivery of quality service with base hospital surgeries.

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2. Materials and Methods

We conducted a retrospective hospital record-based cross-sectional observational study. We analyzed the records of patients operated in camps and records of patients detected to have a cataract in the hospital outpatient department from 2010-2019. Approval from Institutional Scientific and Ethical committee was obtained. This study adhered to the tenets of the declaration of Helsinki.

We conducted 219 outreach camps in 10 years under DBCS in and around Dharwad, Gadag, and Haveri districts in Karnataka, India. During outreach camp, we go to a specified rural area, screen the patients. Patients detected to have a cataract, were dilated for distant direct Ophthalmoscopy to grade the cataract and fundus examination. Blood pressure and Urine sugar testing were

also done at the campsite. Patients having a gross retinal problem or known uncontrolled systemic disease were referred to the higher center.

Diagnosed cases of cataracts were transported to our hospital. Detailed clinical examination of the eye including slit-lamp examination and fundus examination done by our final year postgraduate students. Ocular investigations like intraocular pressure, sac syringing were done. Patients detected to have glaucoma along with cataract were posted for the combined procedure of cataract surgery and trabeculectomy. Patients having dacryocystitis were posted for dacryocystectomy or dacryocystorhinostomy.

Biometry and keratometry were done to calculate intraocular lens (IOL) power in every patient. Preoperatively antibiotic eye drops and systemic antibiotic (Tab Ofloxacin 200mg bd and Ofloxacin eyedrops) started prophylactically for each patient.

The next day they underwent surgery by multiple surgeons, small incision cataract surgery with IOL implantation. Multiple surgeons including postgraduates under guided supervision by seniors performed cataract surgeries. The next day post-operative examination under a slit lamp was done for all the patients. Intraocular pressure by non-contact tonometer and a fundus examination done wherever necessary. Any immediate complication like iris prolapse, shallow anterior chamber, the residual cortex, IOL malposition detected and tackled immediately. Patients were given steroid and NSAID drops for post-operative management. Then patients were transported back to the camp location. Patients were followed up on day three by one of our consultants along with a post-graduate student. Patients detected to have an early complication like compromised vision due to fundal haze or corneal haze or pain in the eye were taken to the hospital and managed immediately. All the patients were advised regarding post-operative care of the eye and asked to approach either the ophthalmic assistant in a local primary health center (PHC) or base hospital immediately if they feel sudden diminution of vision or pain in the operated eye.

Patients were again followed up by an optometrist after 45 days of surgery; to give spectacle correction.

All the surgeries were done free of cost. Transport, in-patient stay, food, medications were provided free of cost to all the patients.

Hospital-based cases detected to have cataracts underwent either phacoemulsification or small incision cataract surgery with rigid or foldable IOL implantation by multiple surgeons. All these patients were paid cases. These cases were taken up after thorough ophthalmic examination, systemic investigations following proper protocol.

Hospital outpatients and camp records were analyzed to see the number of cataract surgeries performed in both the scenarios and intraoperative complications that happened during ten years study duration.

3. Results

A total of 2,08,716 patients were seen in our outpatients' department from 2010-2019. We performed cataract surgery, on 7796 patients.(Table 1)

We screened 27,524 patients through 262 camps from 2010-2019 arranged under DBCS. We operated on 4611 patients for small incision cataract surgery with IOL implant by multiple surgeons. (Table 2)

Among hospital-based cases, we performed either phacoemulsification or small incision cataract surgery with IOL implantation. In 69 cases, intraoperative complications like vitreous loss followed by posterior capsule rupture, capsular bag dialysis including two nucleus drops in hypermature cataracts were noted.

Intraoperative complications occurred in 91 camp cases. Complications were premature entry, iris prolapse, capsulorhexis run-out, bag dialysis, post capsule rupture followed by vitreous loss. Complications managed very well by the camp moderator i.e. senior surgeon. During 58 cases of vitreous loss, anterior vitrectomy done and ACIOL or PCIOL in the sulcus has been put wherever possible. In 3 patients, IOL implant was not possible due to hazy cornea, so left aphakic.

4. Discussion

According to 2019 survey, cataract was the principal cause of blindness 66.2%. We have already achieved the target of cataract surgery rate more than 4000 per million population in most of the states in India.^{4,5} Still, the prevalence of blindness is high because of increased life expectancy and postoperative complications.⁶

The most important reasons for poor outcome (<6/60) of cataract surgery in terms

of visual acuity were other ocular co-morbidities (41.4%) and operative complications (31.2%).⁵

Outcomes of cataract surgery may not be always good and surgical aspects must be examined.⁷ Wrong IOL power calculation and surgical complications can cause significant postoperative visual impairment.⁷⁻⁹ Meticulous preoperative workup of patients, IOL power calculation, and appropriate surgical technique under standardized protocol and postoperative follow-up are required to improve the outcome of the surgery.

Cataract surgery is effective in avoiding blindness, outreach camp for cataracts is an accepted & proven method in reducing blindness.^{9,10} A better visual outcome is achieved with fewer intraoperative complications in outreach camps where surgeries will be done at base hospital.¹¹ This study aims to find out effectivity of outreach camps in reducing the burden of cataract-related blindness.

Modern-day eye camps are conducted in an innovative way to give equivalent results like hospital-based surgeries. We screen our patients at a familiar place of villagers

Table 1: Number of surgeries in base hospital (2010-2019)

No.	Year	Hospital OPD	Number of cataract surgeries	Complications (%)
1	2010	19634	612	0.85
2	2011	23091	968	0.82
3	2012	23345	941	0.85
4	2013	22117	898	1.002
5	2014	23420	823	0.72
6	2015	23341	673	0.89
7	2016	23624	679	1.17
8	2017	24316	797	1.12
9	2018	24362	665	0.75
10	2019	25782	740	0.67
	Total	2,08,716	7796	0.885

Table 2: Number of surgeries and complications in Camp (2010-2019)

No.	Year	Number of camps	Number of patients screened	Number of cataract surgeries done	Complications (%)
1	2010	23	2055	425	2.82
2	2011	33	3905	719	1.8
3	2012	34	3383	778	1.54
4	2013	24	2079	467	1.28
5	2014	34	4154	544	1.83
6	2015	30	2363	518	2.12
7	2016	26	2716	423	1.89
8	2017	19	1850	234	2.56
9	2018	23	3440	356	2.52
10	2019	16	1579	207	1.93
	Total	262	27,524	4611	1.94

like primary health center, temple, or gram panchayat office. Our team includes a local PHC Ophthalmic assistant or Optometrist, Ophthalmology resident doctors, and one consultant. Due to the familiar faces, people get easily convinced for surgery. According to Finger et al. acceptance of services is better if a regular provision of services by the same service provider at the same location helps in building trust.¹²

Screened patients will be transported to the base hospital where detailed clinical examination and investigations will be carried out. For all the patients A-scan biometry and keratometry to calculate IOL power were done. This helps us in reducing postoperative refractive errors. A poor visual outcome has been reported in 15-25% of eyes following cataract surgery (1999);¹³ another recent report (2016) by Paul et al. and Senjum et al. (2009-13) his suggestive of poor visual outcome in 8.8% and 9.4% cases respectively.^{11,14}

A study from central India (2011) revealed the need for improved surgical technique and improved IOL power calculation may markedly improve the visual outcome as 2 out of 3 eyes in their cohorts had poor postoperative visual outcome.⁸

So we emphasized the accuracy of IOL power calculation and improving the quality of surgery to rectify this.

The prevalence of cataract surgery in other studies ranges from 11-35%, in our study is 16.75%. This is a little

higher than Paul et al. (13.94%), Vijaya et al. (13.4%), and Maramula et al. (11.05%).^{11,15,16} Tireless efforts by our camp in charge optometrist and local PHC ophthalmic assistant in doing the advertisement of camp in the form of print and electronic media as well as the routine screening of cataracts during patient's PHC visit has helped us. Quality service provided by us for years; helps in building faith in patients and convincing patients for surgery.

We utilize the same standard facility of aseptic precautions, Operation theatre, microscopes, surgical instruments for our base hospital surgeries & camp surgeries, except intraocular lenses which are supplied by DBCS for camps, this is the reason we get very fewer complications (1.94%) and they are comparable with complications in base hospital surgeries (0.88%). Venkatesh et al. (2003) and Hosamai et al. reported a similar incidence of intraoperative complications.^{10,17}

Among 7796 surgeries were done in base hospital cases, we got intraoperative complications like vitreous loss following post capsule rupture, capsular bag dialysis including two nucleus drops in hypermature cataract cases in 69 cases. In these 14 cases; we put ACIOL in 8 cases in the same sitting and secondary scleral fixating IOL in 6 cases, so we have put IOLs in 100% cases. Other occasional complications like intraoperative iris prolapse, Desmets detachment were handled promptly by

the operating surgeon, so not taken into the account.

Out of 4671 camp surgeries, 3 patients left aphakic due to hazy cornea, later they lost to the follow-up. We had intraoperative complications in 91 cases, for 88 patients we put ACIOL, only 0.0065% of patients did not put IOL. Early postoperative complications like iris prolapse, wound leak, striate keratopathy treated efficiently then and there.

In 1997, Kapoor et al. reported only 3.6% of patients underwent IOL implantation.¹⁸ Vijaya et al.(2010) reported a rate of IOL implantation in 55.4% of cases whereas Nayak et al. in 2014 reported only 0.0075% of patients left aphakic.^{16,17} However, in a south Indian study(2011-12), 86.2% of surgeries done with IOL implantation.¹⁶ This shows availability and skill of IOL implants have been increased with time.

Our study highlights that we are doing qualitatively & quantitatively equivalent results in camp as well as base hospital surgeries

We have compared results at cataract surgery done in our hospital and camps under the national programme; the complication rate is comparable in both scenarios. We are providing quality community service to reduce blindness to achieve vision 2020.

High-quality cataract surgery with a low rate of intraoperative complications in rural camps can help us to clear the burden of avoidable blindness caused by cataracts.

The limitation of this study is we could not compare post-operative visual outcomes due to the retrospective nature of the study causing loss of data.

5. Source of Funding

None.

6. Conflict of Interest

Nil.

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References

1. Dandona L, Dandona R, Srinivas M, Giridhar P, Vilas K, Prasad MN, et al. Blindness in the Indian state of Andhra Pradesh. *Invest Ophthalmol Vis Sci.* 2001;42:908–16.
2. Nirmalan PK, Thulasiraj RD, Maneksha V, Rahmathullah R, Ramakrishnan R, Padmavathi A, et al. A population-based eye survey of older adults in Tirunelveli district of south India: blindness, cataract surgery, and visual outcomes. *Br J Ophthalmol.* 2002;86(5):505–12.
3. Chandrashekar TS, Bhat HV, Pai RP, Nair SK. Coverage, utilization, and barriers to cataract surgical services in rural South India: Results

4. National blindness and visual impairment survey India 2015-2019. Available from: <https://npcbvi.gov.in/writeReadData/mainlinkFile/File341.pdf>.
5. Mactaggart I, Limburg H, Bastawrous A, Burton MJ, Kuper H. Rapid Assessment of Avoidable Blindness: looking back, looking forward. *Br J Ophthalmol.* 2019;103(11):1549–52.
6. Murthy G, Gupta SK, John N, Vashist P. Current status of cataract blindness and vision 2020: The right to sight initiative in India. *Indian J Ophthalmol.* 2008;56:489–94.
7. Foster A. Vision 2020: The cataract challenge. *Community Eye Health.* 2000;13:17–21.
8. Nangia V, Jonas JB, Gupta R, Khare A, Sinha A. Prevalence of cataract surgery and postoperative visual outcome in rural Central India Eye and Medical Study. *J Cataract Refract Surg.* 2011;37(11):1932–8.
9. Gogate P, Kulkarni AN. Comparison of Cataract Surgery in a Base Hospital and in Peripheral Eye Camps. *Community Eye Health.* 2002;15(42):26–7.
10. Hosamani S, Vallabha K, Warad V. Post-operative complications and visual outcome in eye camp patients undergoing sutureless cataract surgery at a Base Hospital in Vijayapura District, South India. *Nigerian J of Ophthal.* 2015;23(1):16–21.
11. Paul P, Kuriakose T, John J, Raju R, George K, Amritan A, et al. Prevalence and Visual Outcomes of Cataract Surgery in Rural South India: A Cross-Sectional Study. *Ophthalmol Epidemiol.* 2016;23(5):309–15.
12. Finger RP, Kupitz DG, Holz FG, Chandrasekhar S, Balasubramaniam B, Ramani RV, et al. Regular provision of outreach increases the acceptance of cataract surgery in South India. *Trop Med Int Health.* 2011;16(10):1268–75.
13. Limburg H, Foster A, Vaidyanathan K, Murthy GV. Monitoring visual outcome of cataract surgery in India. *Bull WHO.* 1999;77:455–60.
14. Senjan S, Vashisht P, Malhotra S. Outcome of Cataract Surgery from Outreach Eye Camp. *Delhi J Ophthalmol.* 2014;25:90–4.
15. Vijaya L, George R, Rashima A, Prema R, Hemamalini A, Mani B, et al. Outcomes of cataract surgery in a rural and urban south Indian population. *Indian J Ophthalmol.* 2010;58(3):223–8.
16. Marmamula S, Khanna RC, Shekhar K, Rao GN. Outcomes of Cataract Surgery in Urban and Rural Population in the South Indian State of Andhra Pradesh: Rapid Assessment of Visual Impairment (RAVI) Project. *PLoS One.* 2016;11(12):e0167708. doi:10.1371/journal.pone.0167708.
17. Venkatesh R, Muralikrishnan R, Balent LC, Prakash SK, Prajna NV. Outcomes of high volume cataract surgeries in a developing country. *Br J Ophthalmol.* 2005;89:1079–83.
18. Kapoor H, Chatterjee A, Daniel R, Foster A. Evaluation of visual outcome of cataract surgery in an Indian eye camp. *Br J Ophthalmol.* 1999;83:343–6.

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