

# Efficacy of Rural Camps at a Tertiary Centre in Dehradun in Achieving Vision 2020

Manisha Gupta, Priyanka Gupta, Ashish Kakkar, Abhinav Arora

Department Of Ophthalmology, SGRR Institute Of Medical & Health Sciences & SMI Hospital, Dehradun, Uttarakhand, India

**Background:-** To establish the effectiveness of rural outreach camps in reducing preventable blindness caused by cataract and achieving VISION 2020 by WHO.

**Materials and Methods:-** It was a retrospective cross-sectional study. Records of patients of our tertiary care centre attending outreach camps conducted during the past 5 years i.e., 2012-2016 were studied. The total number of patients attending the camp and those who were operated for cataract were recorded. Similarly, the number of patients attending the outpatient department at the department of Ophthalmology of our hospital and the number of cases operated for cataract were recorded. Data was tabulated and analyzed.

## Abstract

**Results:-** A total of 1,55,123 patients attended the outpatient department during these five years. Out of these, 2409 cases were detected to have cataract (1.55%). We conducted 816 rural camps under District Blindness Control Society (DBCS) in various peripheral areas of Dehradun district. Out of total 21,703 camp patients screened, 2,111 patients (9.73%) were detected to have cataract and were operated at the hospital. These results were statistically significant. Intraocular lens was implanted in 96.31% camp surgeries and 98.38% of hospital out patient department based surgeries.

**Conclusion:-** Higher numbers of cataracts were detected in the rural parts with the help of outreach camps, as compared to the OPD at tertiary care centre. Patients underwent cataract extraction and implantation of intraocular lens. Hence, conducting outreach camps in rural areas forms an integral part in decreasing the burden of visual morbidity due to cataract and is helpful in achieving VISION 2020.

Delhi J Ophthalmol 2018;29;39-42; Doi <http://dx.doi.org/10.7869/djo.375>

**Keywords:** rural camp; VISION 2020; District Blindness Control Society

## Introduction

Cataract is the most common cause of visual impairment throughout the world, with variation in numbers across regions.<sup>1,2</sup> A national survey during 2001–04 showed the prevalence of blindness was 1.1% and Rapid Assessment of Avoidable Blindness (RAAB) in 2006–07 showed this figure had come down to 1.0%. The main causes of blindness were cataract (62.6%), refractive errors (19.7%), corneal blindness [0.9%], glaucoma (5.8%), surgical complication (1.2%), posterior capsular opacification (0.9%), posterior segment disorder (4.7%) and other causes (4.19%).<sup>3</sup> Blindness is due to various socio-demographic, nutritional, environmental and service delivery factors.<sup>3</sup> This emphasizes the initiatives undertaken by the Government of India in the Eleventh Five-Year plan (2007-12) with the help of NGOs to initiate different health programs at national, state and district levels to control the preventable blindness in India.

In India in the year 2000, 50-70% of preventable blindness was due to senile cataract.<sup>4,7</sup> It is correctly mentioned in literature that cataract surgery is the second most cost effective health intervention after vaccination.<sup>8</sup> Considering this fact “VISION 2020 – The right to sight” had targeted cataract to reduce the burden of curable blindness. Cataract surgery is one of the most commonly performed eye surgery. The surgical era has shifted dramatically from intra capsular cataract extraction with aphakic spectacle correction to femtosecond laser assisted cataract surgery with intraocular lens implantation (IOL) thereby improving the quality of life.<sup>9</sup> However, in most developing countries, there are issues with results of cataract surgeries with poor

outcomes ranging from as low as 11.4% to as high as 44%.<sup>10-15</sup> Now, under the new initiative taken by the NPCB, cataract surgeries are being performed using intraocular lens (IOL) implantation through the modern technique of Small Incision Cataract Surgery (SICS) or Phacoemulsification, both in the public and private sector, to improve not only the quantity but also the quality of cataract outcome.

For success of any health program in India, it is essential that these services must reach the rural area which forms the major chunk of our population. In India, where ignorance about health problems is a major hindrance, awareness provided by these outreach programs is necessary.

The aim of the study was to see the effectiveness of these rural camps held at district levels held under District Blindness Control Society (DBCS) and compare their results both quantitatively and qualitatively with results of cataract surgery of hospital OPD patients. Also, to compare our results with other rural camps held in other districts of the country.

## Subjects and Methods

It was a retrospective hospital record based cross-sectional study. The study was approved by Institutional Scientific and Ethics committee (registration no. ECR/710/Inst/UK/2015). This study adhered to the tenets of the Declaration of Helsinki. Records of patients of our tertiary care centre during 5 years i.e., 2012-2016 were studied. Eight hundred and sixteen outreach camp were conducted by our center under DBCS. Patients detected to have cataract were brought to our center and operated by small incision cataract surgery with IOL implantation. All the surgeries

were performed free of cost. Hospital based cases were operated by phacoemulsification followed by foldable IOL implantation. All the patients were taken up after proper ocular and systemic examination. Cases were operated by multiple surgeons in both settings and followed at day 1, 3, 7, 15 and 30. Hospital outpatient and camp records were analyzed to see the number of outpatients seen and the number of cataract surgeries performed during five years. The results were analyzed using chi square test.

### Results

A total of 1,55,123 patients were seen at the outpatient department of the hospital, out of which 2,409 (1.55%) underwent cataract surgeries (Table 1). A total of 21,703 patients were screened in camps and 2,111 (9.73%) were operated for cataract (Table 2). These results were statistically significant (Table 3) ( $p < 0.001$ ). Out of the total hospital OPD patients, 2409 surgeries were performed and 2307 (98.38%) were implanted with an IOL. The remaining 39 patients (1.62%) were given either aphakic spectacle correction or had a secondary IOL (Table 4). Similarly, in the camp, 2111 surgeries were performed and 2034 (96.31%) were implanted with an IOL. The remaining 77 patients (3.65%) were given either aphakic spectacle correction or a secondary IOL (Table 5). There was statistically no difference in the rate of IOL implantation in hospital based and camp based surgeries (Table 6). Also, an increasing trend is seen each year in the number of camps and surgeries done (Table 2).

### Discussion

For monitoring the progress of VISION 2020, the cataract surgery rate (CSR) per million per year was accepted as an indicator. Evidence based data suggested that if the CSR

**Table 1: Number of Cataract Cases Detected and Operated In Hospital OPD**

Year	Number of patients in Hospital OPD	Number of cataract surgeries	Percentage
2012	29,150	255	0.87%
2013	34,612	524	1.51%
2014	25,908	601	2.32%
2015	29,491	353	1.20%
2016	35,962	676	1.88%
Total	1,55,123	2,409	1.55%

**Table 2: Number of cataract cases detected and operated in outreach camp OPD**

Year	Number of camps conducted	Number of patients in Outreach Camp OPD	Number of cataract surgeries	Percentage
2012	121	3,500	101	2.89%
2013	139	3,980	363	9.12%
2014	185	4,200	412	9.80%
2015	180	4,610	500	10.85%
2016	191	5413	735	13.58%
Total	816	21,703	2,111	9.73%

**Table 3: Comparison of Cataract Surgeries at Hospital and Outreach Camps**

Year	Percentage of hospital based cataract surgery	Percentage of camp based cataract surgery	Z
2012	0.87%	2.89%	1.48
2013	1.51%	9.12%	5.14
2014	2.32%	9.80%	6.23
2015	1.20%	10.85%	18.92
2016	1.88%	13.58%	9.67

**Table 4: Per operative complication rate in hospital based surgeries**

Year	Number of cataract surgeries	Number of per operative complications	Percentage
2012	255	19	7.45%
2013	524	6	1.15%
2014	601	5	0.83%
2015	353	4	1.13%
2016	676	5	0.74%
Total	2,409	39	1.62%

**Table 5: Per operative complication rate in camp based surgeries**

Year	Number of cataract surgeries	Number of per operative complications	Percentage
2012	101	10	9.9%
2013	363	11	3.03%
2014	412	25	6.07%
2015	500	15	3%
2016	735	16	2.1%8
Total	2,111	77	3.65%

**Table 6: Comparison of per operative surgical complication rate in hospital and outreach camps patients**

Year	Complication rate in hospital OPD patients	Complication rate in camp OPD patients	Z
2012	7.45%	9.9%	0.47
2013	1.15%	3.03%	0.24
2014	0.83%	6.07%	2.78
2015	1.13%	3%	0.21
2016	0.74%	2.1%	0.21

rate was 3500 per million per year, the backlog of operable cataracts and incidence of blindness due to cataract can be addressed.

In our study, 1,55,123 patients were attended to in the hospital based OPD, out of which, 2,409 were operated for cataract (Table 1). We found that this surgery rate was lowest i.e. 0.87% in 2012 and highest i.e. 2.32% in 2014.

Our study shows that we conducted 816 camps in the Dehradun district under DBCS in the past five years from 2012 to 2016 (Table 2). Each year, the number of camps has increased. There were 121 camps in 2012 which leaped to

**Table 7: Cataract Surgery Conversion Rate in Camp Patients in Various Studies**

Vivekanand Ashram Mission (West Bengal)	35%
Vijay et al	13.4%
Marmula et al	11.05%
Chennai Glaucoma Study	11.8%
Our study	9.73%

**Table 8: Comparison of Per-Operative Complication Rate in Camp Patients**

Kapoor et al	96.4%
Vijay et al	44.6%
Nayak et al	0.0075%
Our study	3.69%

816 camps in 2016. This shows our tireless effort to reach out to peripheral areas and deliver the health services to more and more rural population. Also, the number of patients has increased exponentially each year which shows that people are getting aware of health services. This also reflects the fact that the quality of service we are providing is satisfactory which attracts more rural population and they have faith in our institutional work. We have an average OPD to surgery conversion rate of 9.37%. It was 2.89% in 2012 and increased to a fruitful figure of 13.58% in 2016 (Table 2). This highlights that people are becoming aware of cataract and its treatment.

The cataract surgery rate in our outreach camp patients was 9.73% (Table 2) which was far more significant (Table 3) than the surgery rate of 1.55% in our hospital based patients (Table 1). This can be explained because our hospital is a tertiary center and we attend large number of patients of other ocular diseases also apart from cataract.

In our study, the cataract surgery rate in outreach camp patients was 9.73% (Table 7), which is comparable with some of the studies done in India<sup>6,12,15-17</sup> and even higher than those reported from neighboring countries such as Nepal, Bangladesh and China.<sup>10,14,18</sup> The outreach camp based report by Vivekananda Mission Ashram in West Bengal reported that 35% of the patients attending the camp were advised surgery.<sup>19</sup> A study by Vijaya et al., showed a prevalence of 13.4% cataracts at rural eye camps.<sup>17</sup> Marmula et al. reported a mean of 11.05% of cataracts recognized at the outreach camps. Chennai Glaucoma Study (CGS) reported an overall prevalence of 11.8%.<sup>17</sup> This shows that the conversion rate in our outreach camps is lesser than other studies, but there is an increasing trend every year as seen in Table 2. Therefore, the performance of our outreach camps was satisfactory to achieve VISION 2020 goal.

In our study, among 2409 hospital based surgeries, IOL was implanted in 2370 patients i.e. 98.38% (Table 5). Per operative complication rate in hospital based cataract surgeries was 1.62%. These patients i.e. 39 patients were given either aphakic spectacle correction or had a secondary IOL (Table 4). Similarly in the camp, 2111 surgeries were performed and 2034 of them were implanted with an IOL i.e. 96.31%.

The remaining 3.65% i.e. 77 patients had peroperative complications who on follow-up were given either aphakic spectacle correction or a secondary IOL (Table 5). This difference was statistically insignificant ( $p > 0.05$ ) (Table 6). It indicates that the quality of surgery done for camp patients was comparable to hospital based surgeries. This shows the efficiency of tackling cataract based visual impairment at our center as compared to other centres of the country (Table 8). In 2008, 5.8 million cataract surgeries with 94% intraocular lens [IOL] implantation were performed at the national level. A study by Kapoor et al in Ludhiana in 1997 showed that only 3.6% of the eyes underwent IOL implantation.<sup>20</sup> In a study by Vijay et al, 55.4% patients in a rural camp were implanted with an IOL, whereas the urban arm had a higher percentage of pseudophakics (72.8%).<sup>17</sup> Nayak et al reported that 0.0075% patients were not implanted with IOL.<sup>21</sup> This shows the change in trend in cataract surgery toward IOL implantation, as IOLs are more easily available. Also people are more aware nowadays about intraocular implantation and cataract surgery. In our study, the rate of IOL implantation was 96.35%. The percentage of IOL implantation has increased each year in the past five years in our centre thereby showing improvement in quality of surgery (Table 2). Thus, the data in our study showed that we are contributing to achieve VISION 2020 both quantitatively and qualitatively.

In our study, by comparing the results of rural camps surgery under NPCB and hospital based surgeries, we conclude that by holding the rural camps we are not only providing quantitative but also qualitative cataract surgeries in achieving the goal of VISION 2020 through DBCS under NPCB. Hence, conducting outreach camps forms an integral part of decreasing the visual morbidity due to cataract. In India, there is a huge regional variation in terms of coverage and outcomes, and therefore regional surveys are required for local planning of eye care services. As we are approaching the year 2020, everyone is expected to have the right to sight. It is high time to see the effectivity of various initiatives taken at all levels to reduce preventable blindness. The limitations of this study are that the visual outcome during postoperative follow-up could not be compared between the two groups due to insufficient data, as it is a retrospective study. Thus, documentation of more details regarding these camps is required to understand their role better.

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**Cite This Article as:** Gupta M, Gupta P, Kakkar A, Arora A. Efficacy of Rural Camps at a Tertiary Centre in Dehradun in Achieving Vision 2020.

**Acknowledgements:** Nil

**Conflict of interest:** None declared

**Source of Funding:** None

**Date of Submission:** 12 July 2017

**Date of Acceptance:** 16 March 2018

### Address for correspondence

**Manisha Gupta ms**

Professor & Head of Ophthalmology  
SGRRIM & HS, SMI hospital, Dehradun, India  
Email id: rajivmanisha@hotmail.com



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