

A Prospective Research to Analyse the Sight Restoration Rate (SRR): A Useful Metric for Determining the Effect of Cataract Surgery

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Conflict of interest: Nil

Abstract

Aim: Study Sight restoration rate (SRR), Useful indicator to measure impact of cataract surgery.

Methods: This prospective study was carried out in the Department of Ophthalmology, Lord Buddha Koshi Medical College & Hospital, Saharsa, Bihar, India, for 1 year. Total 1200 patients were included in this study. Medical records of patients who did Cataract Surgery either SICS or Phacoemulsification, best corrected visual acuity (BCVA) was conducted using the Snellen chart and a pinhole. All of the eye examinations were performed by the same operator. Pre- and post-BCVA were categorized into four categories according to WHO classification. The categories are 6/6-6/18, 6/18-6/60, 6/60-3/60, and 3/60-No Light Perception. Out of all data we excluded patient who did not follow up and all patients with comorbidities which may influence post-operative outcome remaining data considered for analyses.

Results: we studied 1350 eyes, 150 had co morbidities in form of corneal opacities, optic nerve atrophy, retinal detachment, congenital anomalies were excluded. Total 1200 Eyes were studied. The SRR of the surgery in our study 49%. SRR is an indicator to determine the impact of conducting cataract surgeries on people's productivity. In measuring SRR, the best visual acuity of either eye in a patient before the surgery is used. If the best visual acuity of either eye is already more than 3/60, then the cataract surgery is not considered as having an effect on people's productivity. This is the key difference which differentiates SRR from other indicators which are used to determine the success of cataract surgery. Visual outcome <3/60 in 15 eyes (1.25%)

Conclusion: SRR of the surgery in this research is 49%, while our poor surgical outcome is 5.42%. High SRR means that alot of these patients can return to work, while poor surgical outcome means that the surgeries have very good standard. This will optimize "peoples right for sight" as was suggested with Vision 2020 motto.

Keywords: Restoration, Measure, Untreated, Caretaker.

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Introduction

The eyes are the sensory organs which have an important role in human's ability to see. According to WHO data in October 2018, there were 217 million of people around the world with severe visual impairment. Furthermore, 36 million people were blind. Blindness causes difficulty in providing a stable livelihood for the family, participating in social activities, and doing daily activities. Moreover, blind people will become a burden for their family economically and socially due to the stigma towards people with disability. All of that will affect the country's economic conditions later [1,2]. 50% of blindness in the world is caused by cataract. In Indonesia, 500,000 cataract surgeries are needed every year. Perdami statistical report showed there were only about 150,000 to 180,000 cataract surgeries performed in a year. It means there are an additional 320,000-350,000 people who need cataract surgery but they are not able to get it every year [3]. Cataract has been documented to be the most significant cause of bilateral blindness in India where vision < 20/200 in the better eye on presentation is defined as blindness [3,6]. In India cataract has been reported to be responsible for 50-80% of the bilaterally blind in the country [1,6]. Global agencies for the elimination of avoidable blindness have pledged support to operationalizing strategies to reduce the burden of cataract blindness by the "Vision 2020: The right to sight" initiative [7]. Coordinated national efforts were supplemented by a world bank-assisted cataract blindness control project which was launched in seven states of India in 1994 [8]. From around 1.2 million cataract surgeries per year in the 1980s [9] the cataract surgical output increased to 3.9 million per year by 2003 [10]. Recent data from the World Health Organization (WHO) shows that there is a 25% decrease in blindness prevalence in India [11]. This could be due to the increased cataract surgeries in the country. At the same time the proportion of the aged has also

increased significantly in the country. The 60+ population which stood at 56 million in 1991 will double by 2016 [12]. This increase in population means that the population 'at-risk' of blinding cataract will also increase tremendously. India is committed to the goal of elimination of avoidable blindness by 2020 in line with the Global Vision 2020: the right to sight initiative. We used existing surveys, cataract surgical output, and population data, to determine whether India can meet the Vision 2020: the right to sight cataract blindness goals.

Material and methods

This prospective study was carried out in the Department of Ophthalmology, Lord Buddha Koshi Medical College & Hospital, Saharsa, Bihar, India for 1 year. Medical records of patients who did Cataract Surgery either SICS or Phacoemulsification, best corrected visual acuity (BCVA) was conducted using the Snellen chart and a pinhole. All of the eye examinations were performed by the same operator. Pre- and post-BCVA were categorized into four categories according to WHO classification. The categories are 6/6-6/18, 6/18-6/60, 6/60-3/60, and 3/60-No Light Perception. Out of all data we excluded patient who did not follow up and all patients with comorbidities which may influence post-operative outcome remaining data considered for analyses.

Statistical analysis

All records exported from electronic medical records to excel sheet and analyzed with SPSS 24.0. Frequency calculated using descriptive analyses. The frequency of each BCVA categories is taken into accounts. After that we consider frequency and proportion of co-morbidities of the patients. Sight Restoration Rate is calculated using the standard formula [13].

Results

Our cohort included 1350 eyes 150 had comorbidities in form of corneal opacities,

optic nerve atrophy, retinal detachment, congenital anomalies were excluded. Total 1200 Eyes were studied. The SRR of the surgery in our study 49%. SRR is an indicator to determine the impact of conducting cataract surgeries on people's productivity. In measuring SRR, the best visual acuity of either eye in a patient before the surgery is used. If the best visual acuity

of either eye is already more than 3/60, then the cataract surgery is not considered as having an effect on people's productivity. This is the key difference which differentiates SRR from other indicators which are used to determine the success of cataract surgery. Visual outcome <3/60 in 15 eyes (1.25%)

Table 1: gender distribution of patients

Gender	Number of eyes =1200	%
Male	750	62.5
Female	450	37.5

Table 2: SRR rate

SRR rate	49%
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Discussion

A study in the United States showed cataract surgery not only restores the patients' life quality but also has a very high return on investment (ROI) up to 45.67% 13 years after the surgery[14] Another study stated cataract surgery is one of the most effective health interventions which will reduce the cost of rehabilitating the patient with a disability with an estimated reduction of 2040\$/year/people[15] It happens because blindness has a huge correlation with economic productivity of its victim and the caretakers for a very long time if it is not cured.[16] One of the indicators of the success of the cataract surgeries is the Sight Restoration Rate (SRR)[15]SRR shows the percentage of patients whose sight restored after the surgery. The weakness of using SRR is this measure can be influenced by selectively removing patients whose sights failed to be restored. However, all patients who were operated during the study period are also included to minimize the bias.

Performing eyes surgery with BCVA more than 3/60 are not the goal of Vision. 2020. The eyes surgery's main goal is not only to reduce the numbers of blindness but also to increase patients' life quality.[14] The SRR of the eyes surgery in this study is 49%.

This number is higher than other surgeries performed by Eye camps (39%), Ludhiana (35%), and Ludhiana'94 (28%)[13] The better way to selectively choose those who would gain the most benefit from the surgery is needed. Hence, some patients who have a bad prognosis still need the surgery to prevent the later complications (e.g. hyper-mature cataract which can lead to capsular fibrosis, phacolytic-Phacoanaphylactic reaction, or zonula dialysis). Developing countries have a high number of blindness because some residences are far from health facilities. Timely and more targeted screening is essential in resolving this problem.[16,19] Another important factor in handling this problem is to empower the communities to socialize the benefit of cataract surgery.

A study showed 2/3 of patients are convinced to have the surgery due to the encouragement from family or close relatives.[19]

Another factor which can be used to determine the success of cataract surgery is the proportion of patients with the poor surgical outcome (i.e. BCVA <3/70).¹³ The proportion of BCVA <3/60 of the eyes surgery in this study is 1%. This number is lower than the criteria from WHO for poor outcome, which is 5%.²⁰ The main cause of

poor outcome is uncorrected refraction problem, comorbidities, and surgical complications. The quality of cataract surgery can be improved by retraining the operator, improving the health system, facilities, and surgical equipment, and establishing a better monitoring system[21] (Unfortunately, the lack of human resources is still the main problem in developing countries. There must be a balance between intervention costs and its results when conducting cataract surgery in resource-limited settings[17].

Conclusion

SRR of the surgery in this research is 49%, while our poor surgical outcome is 5.42%. High SRR means that a lot of these patients can return to work, while poor surgical outcome means that the surgeries have very good standard. This will optimize “people's right for sight” as was suggested with Vision 2020 motto.

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