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## A Prospective Study of Vision Related Quality of Life in Patients with Pre and Post-operative Bilateral Cataract surgery in a Tertiary care Hospital.

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### ABSTRACT

As most of the cataracts are related to the ageing process and at the same time the proportion of the ageing population are increasing significantly and this increase in population means that the population at-risk of blinding cataract will also increase tremendously. Although cataracts can be removed surgically, surgical services may be inadequate in developing countries. In planning medical services for cataract patients, it is essential to include the assessment of post-surgical outcomes in terms of visual acuity and vision related quality of life in preoperative cataract patients and to determine the impact of cataract surgery on visual function and vision-related quality of life after surgery among bilateral cataract patients. 264 subjects of either gender were included in the study to assess visual function outcome and also to determine the vision-related quality of life, after surgery among bilateral cataract patients by using VF-14 questionnaires. Two sixty-four subjects were assessed before cataract surgery and 250 completed the follow-up assessment at four and twelve weeks after both eye cataract surgery. Overall, vision and vision related quality of life was significantly improved after cataract surgery ( $p < 0.005$ ) particularly after twelve weeks after the cataract surgeries. Cataract surgery significantly improved VRQOL among bilateral cataract patients.

**Keywords:** Cataract, Quality of life, Visual acuity, Visual Function Index (VF-14)

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## INTRODUCTION

Cataract is opacity within the lens of the eye which prevents clear vision [1]. According to the latest assessment, cataract is responsible for 47.8% of world blindness, and in south Asian region which includes India, 51% of blindness is due to cataract. In India cataract is the principal cause of blindness accounting for 62.6% cases of blindness [2], and the prevalence is three times greater than in the United States, with 82% of Indians aged 75 to 83 years affected by cataracts, compared with only 46% of US individuals from the same age group [3]. Age related cataract remains the single major cause of blindness in most developing countries, including India. Declining birth rates and a rapidly increasing life expectancy have led to an increase of the population above 60 years of age [4]. This combined with the limited capacity to cover the increased demand for cataract surgical services, causes an increase in blindness from age related cataract. Although cataracts can be removed surgically, surgical services may be inadequate in developing countries and even where surgical services are available, low vision associated with cataract surgery may still be prevalent [2]. To deal with such a vast problem of blindness it is imperative to know its magnitude in order to mobilize resources and in planning of medical services for cataract patients, it is essential to include the assessment of post-surgical outcomes not only in terms of visual acuity, but also for patient self-reported visual functioning and vision related quality of life [5].

Though strong evidence exists that cataract surgery significantly improves vision-related quality of life (VRQOL), majority of research has been conducted in developed countries. However, few studies have been done in Indian population to assess the visual function and vision related quality of life (VRQOL) in preoperative cataract patients and the impact of cataract surgery on visual function and vision-related quality of life, and hence the present study was taken up.

## MATERIALS AND METHODS

This observational study was done to assess the visual function and vision related quality of life (VRQOL) in pre and postoperative cataract patients. After approval and clearance from the Institutional Ethics Committee, 264 consecutive subjects with visually disabling simple cataract, aged 40 years or older willing to undergo cataract surgery at outpatient department of Ophthalmology, Kempegowda Institute of Medical sciences, Hospital and Research Centre, Bangalore were included into the study by the investigator after coordinating and confirming the diagnosis with eye specialist. Study subjects were recruited by purposive sampling method from June 2014 - June 2015. Written informed consent was obtained from all the study subjects after fully explaining the study procedure to their satisfaction, in both English and vernacular language and the study objectives were;

- To assess the visual function and vision related quality of life (VRQOL) in preoperative cataract patients.
- To determine the impact of cataract surgery on visual function and vision-related quality of life after surgery among bilateral cataract patients.

Subjects fulfilling the inclusion criteria were included into the study; Patients with visually disabling simple cataract, aged 40 years or older from either gender attending the outpatient department of ophthalmology and willingness of the patients or legal representatives to give the written informed consent and available for follow up. Patients with the following conditions were excluded from the study; patients with previous cataract surgery, injury or diabetes-related cataract, glaucoma or any other significant ocular conditions, dementia, parkinson's disease, schizophrenia. Patients were subjected to a detailed history taking including the age, sex, socioeconomic status, occupational status and medical history. Visual acuity and vision related quality of life was assessed both preoperative (baseline) and postoperatively in both the eyes. Post operatively visual acuity and vision related quality of life were recorded at one month (visit-1) and three months (visit-2) after the cataract surgery. The pre and postoperative visual function assessment was done using the VF-14 questionnaire [6]:

- Reading small print such as labels on medicine bottles, or a telephone book
- Reading a newspaper or book
- Reading a large print book or large print newspaper or numbers on a telephone

- Recognizing people when they are close to you
- Seeing steps, stairs, or curbs
- Reading traffic, street, or store signs
- Doing fine handwork like sewing, knitting, crocheting, or carpentry
- Writing cheques or filling out forms
- Playing games such as bingo, dominoes, card games, or mahjong
- Taking part in sports like bowling, handball, tennis, or golf
- Cooking
- Watching television
- Daytime driving
- Night-time driving

For activity that had a response of “no” the score was 4. In activity for which the response was “yes”, respondents were asked how much difficulty they currently had with the activity - “a little difficulty” had a score of 3, “moderate difficulty” had a score of 2, “great difficulty” had a score of 1 and “unable to do it” had a score of zero. Each scored item was then multiplied by 25 to give a highest score of 100 (able to perform all applicable activities without any difficulty) and a lowest score of zero (unable to do the applicable activity because of poor vision).

The data collected was analyzed by using descriptive statistics, namely mean, standard deviation, and repeated measures anova. The results were also depicted in the form of tables and graphs.

**RESULTS**

A total of 264 patients who met the inclusion criteria were enrolled for the study. However 250 patients were available for review at 4 and 12 weeks postoperatively. The demographic data of the study subjects is presented in the **Tables-1**. The age of the patients ranged from 50 to 80 years and majority of the subjects were in the age group of 60-69 years with a mean of 66.18 ± 7.18. There were 170 males and 80 females and majority of the female patients (73 (29.2%)) were housewives. **Table-2** summarizes the assessment of pre and postoperative visual acuity in all the study subjects. Among 250 study subjects the baseline visual acuity was 6/60 in 96.8% (242 of 250), 6 subjects had a vision of counting the finger from 2mm and two from the distance of 1mm. Post operatively at visit-1 the visual acuity in 24 (9.6%) subjects was 6/18 and in 226 (90.4%) subjects it was 6/12. At visit-2, 226 (90.4) showed good improvement with normal/near normal vision of 6/9 and 24 (9.6) progressed to 6/12. Patient’s mean visual test scores before and after cataract surgery are presented in **Table-3**. There was statistically significant (**p < 0.0005**) improvement in the vision from baseline (24.52± 3.27) to visit-1 (58.56±3.49), and from visit-1 (58.56±3.49) to visit-2 (85.56±3.59). **Table-4 and Table-5** presented preoperative and postoperative responses to individual VF-14 items. All the 250 subjects could able to respond all the 14 questions/activities. There was a definite improvement in all the study subjects both during visit-2 and 3 compared to baseline (preoperative) responses/activities and maximum improvement was observed at visit-3 (after three months) compared visit-2 (after one month postoperatively). The mean vision-related quality of life scores before and after cataract surgery is depicted in **Table-6** (visit-1) and **Table-7** (visit-2). The change was almost similar for all the activities

**Table 1: Age and gender distribution (n = 250)**

| Age in years | Gender n (%) |            |             |
|--------------|--------------|------------|-------------|
|              | Male         | Female     | Total       |
| 50-59        | 38(22.35)    | 16(20)     | 54(21.6)    |
| 60-69        | 74(43.52)    | 30(37.5)   | 104(41.6)   |
| 70-79        | 56(32.94)    | 32(40)     | 88(35.2)    |
| >80          | 2(1.17)      | 2(2.5)     | 4(1.6)      |
| Total        | 170(100)     | 80(100)    | 250(100)    |
| Mean ± SD    | 65.66± 7.20  | 67.28±7.19 | 66.18± 7.18 |

**Table 2: Assessment of visual acuity (n = 250)**

| Visual acuity       | Before surgery<br>n (%) | 1 month after surgery<br>n (%) | 3 month after surgery<br>n (%) |
|---------------------|-------------------------|--------------------------------|--------------------------------|
| 6/60                | 242(96.8)               | -                              | -                              |
| Counting finger 1mm | 2(0.8)                  | -                              | -                              |
| Counting finger 2mm | 6(2.4)                  | -                              | -                              |
| 6/18                | -                       | 24(9.6)                        | -                              |
| 6/12                | -                       | 226(90.4)                      | 24(9.6)                        |
| 6/9                 | -                       | -                              | 226(90.4)                      |

**Table 3: Mean visual score during each visits**

| Vision score | Mean±SD     |
|--------------|-------------|
| Baseline     | 24.52± 3.27 |
| Visit 1      | 58.56±3.49  |
| Visit 2      | 85.56±3.59  |

p < 0.0005 ( Repeated measure Anova)

**Table 4: Preoperative and one month postoperative responses to individual VF-14 items (n = 250) among study subjects**

| Questionnaire         | Preoperative (%) |        |          |       |              | Postoperative(%) |        |          |       |              |
|-----------------------|------------------|--------|----------|-------|--------------|------------------|--------|----------|-------|--------------|
|                       | None             | Little | Moderate | Great | Unable to do | None             | Little | Moderate | Great | Unable to do |
| Reading small print   | -                |        |          |       | 100          |                  | -      | 95.2     | 4.8   |              |
| Reading the newspaper | -                |        |          | 52.8  | 47.2         |                  | 16.4   | 83.6     |       |              |
| Reading large print   | -                |        | 42.8     | 57.2  |              |                  | 80.8   | 19.2     |       |              |
| Recognizing people    | -                |        | 53.2     | 46.8  |              |                  | 97.2   | 2.8      |       |              |
| Seeing steps or curbs | -                |        | 26.4     | 73.6  |              |                  | 68.4   | 31.6     |       |              |
| Seeing signs          | -                |        |          | 52    | 48           |                  | 45.2   | 54.8     |       |              |
| Doing fine handwork   |                  |        |          | 69.6  | 30.4         |                  | 1.2    | 81.6     | 17.2  |              |
| Writing checks        |                  |        | 58       | 41.6  | 0.4          |                  | 64.4   | 35.6     |       |              |
| Playing games         |                  |        | 25.2     | 74    | 0.8          |                  | 23.2   | 75.6     | 3?    |              |
| Playing sports        |                  |        |          | 76.4  | 23.6         |                  | 23.2   | 76.8     |       |              |
| Cooking               |                  |        | 30.8     | 69.2  |              |                  | 95.6   | 4.4      |       |              |
| Watching TV           |                  |        | 50.8     | 48.8  | 0.4          |                  | 87.6   | 12.4     |       |              |
| Daytime driving       |                  |        |          | 44.8  | 55.2         |                  | 36.4   | 48       | 2.8   | 12.8         |
| Night driving         |                  |        |          |       | 100          |                  |        | 36.4     | 42.8  | 20.8         |

**Table 5: Preoperative and three months postoperative responses to individual VF-14 items (n = 250) among study patients**

| Questionnaire         | Preoperative (%) |        |          |       |              | Postoperative (%) |        |          |       |              |
|-----------------------|------------------|--------|----------|-------|--------------|-------------------|--------|----------|-------|--------------|
|                       | None             | Little | Moderate | Great | Unable to do | None              | Little | Moderate | Great | Unable to do |
| Reading small print   | -                |        |          |       | 100          |                   | 58     | 42       |       |              |
| Reading the newspaper | -                |        |          | 52.8  | 47.2         | 34                | 66     |          |       |              |
| Reading large print   | -                |        | 42.8     | 57.2  |              | 79.6              | 20.4   |          |       |              |
| Recognizing people    | -                |        | 53.2     | 46.8  |              | 91.6              | 8.4    |          |       |              |
| Seeing steps or curbs | -                |        | 26.4     | 73.6  |              | 77.2              | 22.8   |          |       |              |
| Seeing signs          | -                |        |          | 52    | 48           | 47.2              | 52.8   |          |       |              |
| Doing fine handwork   |                  |        |          | 69.6  | 30.4         |                   | 90     | 10       |       |              |
| Writing checks        |                  |        | 58       | 41.6  | 0.4          | 75.2              | 24.8   |          |       |              |
| Playing games         |                  |        | 25.2     | 74    | 0.8          | 50                | 50     |          |       |              |
| Playing sports        |                  |        |          | 76.4  | 23.6         | 46.8              | 53.2   |          |       |              |
| Cooking               |                  |        | 30.8     | 69.2  |              | 82.4              | 17.6   |          |       |              |
| Watching TV           |                  |        | 50.8     | 48.8  | 0.4          | 61.6              | 38.4   |          |       |              |
| Daytime driving       |                  |        |          | 44.8  | 55.2         | 33.6              | 66     |          |       | 0.4          |
| Night driving         |                  |        |          |       | 100          |                   | 10     | 82.4     | 7.2   | 0.4          |

**Table 6: Mean change in pre and one month postoperative individual questions (VF-14)**

| Questionnaire         | Preoperative Mean(SD) | Postoperative 1month Mean(SD) | Change |
|-----------------------|-----------------------|-------------------------------|--------|
| Reading small print   | 0(0)                  | 1.95(0.21)                    | 1.95   |
| Reading the newspaper | 0.52(0.50)            | 2.16(0.37)                    | 1.64   |
| Reading large print   | 1.42(0.49)            | 2.80(0.39)                    | 1.38   |
| Recognizing people    | 1.53(0.49)            | 2.97(0.16)                    | 1.44   |
| Seeing steps or curbs | 1.26(0.44)            | 2.68(0.46)                    | 1.42   |
| Seeing signs          | 0.52(0.5)             | 2.45(0.49)                    | 1.93   |
| Doing fine handwork   | 0.69(0.46)            | 1.84(0.39)                    | 1.15   |
| Writing checks        | 1.57(0.50)            | 2.64(0.47)                    | 1.07   |
| Playing games         | 1.24(0.44)            | 2.22(0.44)                    | 0.98   |
| Playing sports        | 1.23(0.42)            | 2.23(0.42)                    | 1      |
| Cooking               | 1.30(0.46)            | 2.95(0.20)                    | 1.65   |
| Watching TV           | 1.50(0.50)            | 2.87(0.33)                    | 1.37   |
| Daytime driving       | 0.44(0.49)            | 2.08(0.94)                    | 1.64   |
| Night driving         | 0(0)                  | 1.15(0.74)                    | 1.15   |

**Table 7: Mean change in pre and three months postoperative individual questions (VF-14)**

| Questionnaire         | Preoperative Mean(SD) | Postoperative 3 months Mean(SD) | Change |
|-----------------------|-----------------------|---------------------------------|--------|
| Reading small print   | 0(0)                  | 2.58(0.49)                      | 2.58   |
| Reading the newspaper | 0.52(0.50)            | 3.34(0.47)                      | 2.82   |
| Reading large print   | 1.42(0.49)            | 3.79(0.40)                      | 2.37   |
| Recognizing people    | 1.53(0.49)            | 3.91(0.27)                      | 2.38   |
| Seeing steps or curbs | 1.26(0.44)            | 3.77(0.42)                      | 2.51   |
| Seeing signs          | 0.52(0.5)             | 3.47(0.50)                      | 2.95   |
| Doing fine handwork   | 0.69(0.46)            | 2.9(0.30)                       | 2.21   |
| Writing checks        | 1.57(0.50)            | 3.75(0.43)                      | 2.18   |
| Playing games         | 1.24(0.44)            | 3.5(0.50)                       | 2.26   |
| Playing sports        | 1.23(0.42)            | 3.46(0.49)                      | 2.23   |
| Cooking               | 1.30(0.46)            | 3.82(0.38)                      | 2.52   |
| Watching TV           | 1.50(0.50)            | 3.61(0.48)                      | 2.11   |
| Daytime driving       | 0.44(0.49)            | 3.32(0.51)                      | 2.88   |
| Night driving         | 0(0)                  | 2.02(0.43)                      | 2.02   |

**DISCUSSION**

In the present study, the visual function and vision related quality of life in pre and postoperative bilateral cataract patients was assessed in subjects attending the ophthalmology outpatient department in KIMS Hospital and Research Centre, a tertiary care teaching hospital. All the study subjects fulfilled the inclusion and exclusion criteria and were available for follow up at three and twelve weeks. The majority of the subjects were in the age group of 60-69 years with a mean of  $66.18 \pm 7.18$  [7, 8]. Many studies have shown that the age related cataract is the most common and is responsible for 47.8% of world blindness [2, 9]. One study has shown that, age-related lens changes in 42% between the ages of 52 and 64, and 60% between the ages 65 and 74, and 91% between the ages of 75 and 85. The male predominance is probably because of the better awareness about health and economic independence compared to females [10]. In our study there was significant improvement in the visual function and vision related quality of life from baseline to visit-1 and from visit-1 to visit-2. The high levels of postoperative visual function and vision related quality of life in the current study was most probably due to high-quality surgery, surgical skills and also care provided postoperatively. Also the bilateral surgery may be associated with better visual function outcomes as observed in other studies [11]. Some of the studies have reported poor visual outcomes, low visual function and quality of life with cataract surgery [12, 13]; however some studies have shown excellent outcomes [12, 14]. These state that cataract surgeries do not consistently produce favourable visual function and quality of life

outcomes. The improvement of outcome should be given greater importance and certain corrective measures are required to improve the performance of eye surgeon and the team involved in the surgery because, studies have shown that people with cataract visual impairment have poorer vision and vision related poor quality of life, they will less likely to undertake and spent less time on productive activities, more likely to receive assistance with activities and will be economically poorer compared to without vision impairment [15, 16]. Good surgical outcomes like; excellent postoperative visual function and quality of life is required to reduce the economic burden to the patients, to improve their productive activities and to reduce their physical dependence [15]. In this regard it is necessary to evaluate post-surgical outcomes not only on the basis of visual acuity, but also on self-reported visual function and vision-related quality of life [17]. These assessments may explain the full spectrum of disabilities associated with visual impairment from cataracts and improve the treatment approach and rehabilitation of patients. However, the patient follow-up is important and should be conducted carefully, as the untreated complications of the surgery may affect the stability of patient postoperative visual and quality of life [15].

### CONCLUSION

In conclusion, this study has provided valuable information about significant change in visual function and vision related quality of life after cataract surgery among bilateral cataract patients.

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### REFERENCES

- [1] Varun B Gupta, Manjusha Rajagopala, and Basavaiah Ravishankar. Indian J Ophthalmol 2014; 62(2): 103-110.
- [2] Avachat SS, Phalke V and Kambale S. J Family Med Primary Care 2014; 3(1): 45- 47.
- [3] Brian G and Taylor H. Bull World Health Org 2001; 79 (3): 249-256.
- [4] Rehman SU, Kaunsar R, Kadri SM, Jan HR , Sajad Sheikh S. International Journal of Research in Medical Sciences 2014;2(1):145-150.
- [5] Lau J, Michon JJ, Chan WS and Ellwein LB. Br J Ophthalmol 2002; 86(1): 12–17.
- [6] Friedman DS, Tielsch JM, Vitale S, Bass EB, Schein OD, Steinberg EP. Br J Ophthalmol 2002;86:885–891.
- [7] Olawoye O, Ashaye A, Bekibele C, Ajuwon AJ. WAJM 2012; 31(2): 114–119.
- [8] Bhagwan J, Rastogi IM , Malik JS, Dhull CS. Indian J Comm Med 2006;31(2): 66-68.
- [9] Hosamani SA, Vallabha K. J Clin Ophthalmol Res 2014;2:13-4.
- [10] Chanchlani M, Sarkar N, Manghani J, Soni B, Chanchlani R. JEMDS 2014;3(6): 1536-1541.
- [11] Zuo L, Zou H, Fei X, Xu W, and Zhang J. J Ophthalmol 2014:1-6.
- [12] Nathan G. Congdon, Srinivas K. Rao, Xiaqing Zha et.al. Arch Ophthalmol 2007;125(11):1546-1552
- [13] Pokharel GP, Lelvaraj S, Ellwein LB. Br J Ophthalmol 1998;82(6):606-610.
- [14] Mamidipudi PR, Vasavada AR, Merchant SV et al. J Cataract Refract Surg 2003;29(6):1143-1151.
- [15] I-Bo Zhou, Huai-Jin Guan, Dong-Qing Zhu et al. Exp Ther Med 2013; 5(6): 1725–1731.
- [16] Paula Teixeira de Mendonça, Leonardo Teixeira de Mendonça, Alexandre Antônio Marques Rosa et.al. Arq Bras Oftalmol 2014;77(1):12-6
- [17] Danquah L, Kuper H, Eusebio C, Rashid MA, Bowen L, Foster A, and Polack S. Plos One 2014;9(4): 1-10.