

Original article:

A post cataract surgery survey of rural population in northwest India

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Abstract:

Many decades have elapsed still cataract remains major ophthalmic disability though NPCB also has emphasized much to eliminate this important public health problem. Though the number of cataract surgeries have increased from 1.2 million/year in 1992 to 3.86 million/year in the year 2003. In the “Vision 2020: The Right to Sight” initiative the target was to perform 21.1 million cataract surgeries during 2002-07 with 80% intraocular lens implantation. Though we have met the cataract surgeries target as we had decided in our national policy still we are facing issues and challenges regarding poor outcomes of it. Therefore, the present study is a population-based cross-sectional study in a rural northwestern Indian population aged ≥ 40 years with the objective to assess visual outcome after cataract surgery and factors associated with it.

In our study, the visual outcomes after cataract surgery were better in eyes with pseudophakia. Uncorrected refraction, surgery-related complications such as PCO and CME were the major causes for poor outcomes.

INTRODUCTION:

Many decades have elapsed still cataract remains major ophthalmic disability.[1-4] though NPCB also has emphasized much to eliminate this important public health problem[5]. Though the number of cataract surgeries have increased from 1.2 million/year in 1992 to 3.86 million/year in the year 2003.[6] In the “Vision 2020: The Right to Sight” initiative the target was to perform 21.1 million cataract surgeries during 2002-07 with 80% intraocular lens implantation.[7] Though we have met the cataract surgeries target as we had decided in our national policy still we are facing issues and challenges regarding poor outcomes of it.[8-11] Therefore, the present study is a population-based cross-sectional study in a rural northwestern Indian population aged ≥ 40 years with the objective to assess visual outcome after cataract surgery and factors associated with it.

OBJECTIVE:

To study outcomes of cataract surgery among ≥ 40 years age group

METHODOLOGY:

Study Design: Cross-sectional study. **Study Place:** Rural area of Nagaur District, Rajasthan. **Study Duration:** 2 years. **Sample size:** 550 patients (694 operated eyes) who had been operated for cataract.

Sampling technique: Cluster sampling

Method: Written informed consent was obtained from eligible subjects. All subjects underwent a complete ophthalmic examination. Examination consisted of measuring the best-corrected visual acuity using the modified ETDRS chart, applanation tonometry, gonioscopy, grading of lens opacities using LOCS II,[12] stereoscopic evaluation of the optic nerve head and macula at the slit-lamp using a +78 diopter lens, a detailed retinal examination with a binocular indirect ophthalmoscope, and optic disc and fundus

photography. Those operated on for cataract were queried as to the date and place of surgery. The principal cause of reduced vision was identified for all examined eyes with presenting visual acuity worse than 6/18.

The presenting visual acuity was measured using logarithm of minimum angle of resolution (logMAR) 4-meter charts at 4 meters, those unable to read the top line of the chart were tested at 1 meter. Landolt's C chart was used for those who could not read English. Monocular visual acuity was recorded with the current spectacle prescription, if any. Pinhole acuity was also studied in eyes with a visual acuity less than 20/20 (logMAR 0.0) to estimate the end point of subjective refraction. The best-corrected visual acuity was ascertained and the value recorded. If the visual acuity could not be measured we used the following tests sequentially: Counting fingers, hand movements and light perception. The probable method of surgery performed, the presence or absence of intraocular lens (IOL), type of IOL (anterior and posterior chamber) and possible cataract-related complications were documented. The visual outcome of eyes was assessed based on the presenting and best-corrected visual acuity. We classified people with at least primary education as literate and people with no formal education as illiterate.[13] Data analysis was carried out using SPSS (SPSS Inc., Chicago,

IL). Significance was assessed at the $P < 0.05$ level for all parameters. Multivariate analysis for age, gender, duration from surgery and literacy was done after adjusting for age (the age group of 40-49 years was used as the reference age group). In bilaterally operated persons only the right eye was included for multivariate analysis.

RESULTS

A total of 550 patients were included in study with mean age of 53.8 ± 10.6 years (210 males, 340 females, 628 eyes) had undergone cataract surgery. Outcome of cataract surgery was defined based on visual acuity. Using best-corrected visual acuity for classification, the single most important cause for visual impairment was cystoid macular edema in the aphakic group and posterior capsule opacification in the pseudophakic group.

Maximum 37.45% study population belonged to 50-59 years age group. 38.18% were males, 46.73% were literate [Table-1]. According to multiple logistic regression modeling, those who were illiterate were more likely (OR 1.9; 95% CI 1.4 to 2.7) to have visual acuity of $<20/60$ to $\leq 20/400$ or visual acuity of $<20/400$ (OR 1.14; 95% CI 1.2-2.6). The female cataract-operated population was less likely (OR 1.21; 95% CI 0.9-1.98) to have visual acuity of $<20/60$ to $\leq 20/400$ and visual acuity of $<20/400$ (OR 1.01; 95% CI 0.6-1.57) [Table 2].

Table-1: Demographic Characteristics of Study Population (N=550)

S.No.	Demographic Feature	No.	%
1.	Age (years)		
	• 40-49	114	20.72
	• 50-59	206	37.45
	• 60-69	146	26.54
	• 70-79	68	12.36
	• >80	16	2.90
2.	Gender		

	<ul style="list-style-type: none"> • Male • Female 	210 340	38.18 61.82
3.	Literacy <ul style="list-style-type: none"> • Literate • Illiterate 	257 293	46.73 53.27
4.	Laterality <ul style="list-style-type: none"> • Unilateral • Bilateral 	472 78	85.82 14.18
5.	Duration of surgery <ul style="list-style-type: none"> • <3 years • ≥3 years 	211 339	38.36 61.64
6.	<ul style="list-style-type: none"> • Pseudophakia • Aphakia 	136 414	24.73 75.27

Table-2: Multiple logistic regression risk factors for visual impairment in cataract operated patients

S.No.	Demographic Feature	Visual acuity (<20/60 to ≤20/400) odds ratio (95% CI)	Visual acuity (<20/400) odds ratio (95% CI)
1.	Age (years) <ul style="list-style-type: none"> • 40-49 • 50-59 • 60-69 • 70-79 • >80 	1 2.3 (1-6.9) 1.5 (0.6-3.8) 1.8 (0.9-5.1) 2.1 (0.6-6.2)	1 1.8 (1.6-2.3) 1.7 (0.9-4.1) 2.0 (0.9-4.2) 2.5 (0.4-5.4)
2.	Gender <ul style="list-style-type: none"> • Male • Female 	1 1.21 (0.9-1.98)	1 1.01 (0.6-1.57)
3.	Literacy <ul style="list-style-type: none"> • Literate • Illiterate 	1 1.9 (1.4-2.7)	1 1.14 (1.2-2.6)
4.	Laterality <ul style="list-style-type: none"> • Unilateral • Bilateral 	1 1.7 (0.7-2.2)	1 1.7 (0.7-2.2)
5.	Duration of surgery <ul style="list-style-type: none"> • <3 years • ≥3 years 	1 1.0 (0.6-2.1)	1 0.9 (0.8-5.4)

DISCUSSION:

The rural study population was derived from 4 villages of Nagaur district. In terms of numerical surgical performance the state was completing the pre-determined targets.

Our findings re-emphasize those reported by the other studies, reiterating the need for appropriate refraction and spectacle prescription following cataract surgery.[8-10] Poor outcomes due to uncorrected refraction will remain a major cause for poor visual outcome after cataract surgery, unless this is addressed.

Small-incision cataract surgical techniques have lower induced astigmatism than conventional extracapsular cataract extraction, and are becoming increasingly popular. With increased penetration of these surgical techniques, it is possible, that the number of those with visual impairment due to uncorrected refractive error will decline. The surgical technique and choice of IOL inserted should be tailored to individual patient parameters and refractive needs (as determined from a good history, a comprehensive eye examination and appropriate IOL power measurements) and should aim for near emmetropia postoperatively in the majority of cases.

Nirmalan *et al.*[10], Vijaya L *et al* [11] conducted similar study in south India during the same time period in a rural population residing in a southern district of Tamil Nadu. They reported higher pseudophakia rate in their study could be due to the fact that their study area was a reputed non-governmental organization hospital with dedicated trained ophthalmologists. Our low rate of pseudophakia was related to the technique followed;

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reason could be probably due to the differences in the availability of eye care services in the study areas.

Surgery-related problems were responsible for visual impairment in both the pseudophakic and aphakic groups. In the pseudophakic group, the main cause of visual impairment was PCO. The causes of PCO are multifactorial.[12] Technique of the surgery, type of IOL used, and postoperative inflammation are some of the factors. From our data we could not identify the causes of PCO in our population. Improvement in surgical technique and appropriate postoperative follow-up could reduce the chances of PCO. In the aphakia group the main cause was CME, since CME is related to surgery and can be prevented/reduced with improved surgical technique.

In our study, the visual outcomes after cataract surgery were better in eyes with pseudophakia. Uncorrected refraction, surgery-related complications such as PCO and CME were the major causes for poor outcomes. The goal of the national program is to perform 80% of the cataract surgeries with IOLs. It is encouraging to know that this target can be achieved with improved training programs and strengthening of the eye care infrastructure. WHO has provided guidelines for cataract surgery outcomes- 85% should have visual acuity of 20/60 or better, 10% have less than 20/60-20/200 and less than 5% should have a visual acuity of less than 20/200.[13]

CONCLUSION:

There should be equal emphasis on improvement in occurrence of adverse outcomes after surgery.

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