

Coverage and sociodemographic association of cataract surgery among elderly population of Aligarh: A cross-sectional study

Mohd Najmul Aqib Khan, M Athar Ansari, Anees Ahmad, Salman Khalil, Mohd Maroof

Department of Community Medicine, JN Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Correspondence to: Mohd Najmul Aqib Khan, E-mail: drmnajul@gmail.com

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ABSTRACT

Background: Cataract is one of the most common causes of avoidable blindness in India. Cataract surgical coverage (CSC) is an important indicator of the need for improvement in eye care services. **Objectives:** The objectives of the study were to find out the CSC and its association with sociodemographic factors among elderly population. **Materials and Methods:** This study was part of a community-based cross-sectional study carried out among elderly population residing at field practice area of Rural Health Training Centre and Urban Health Training Centre, JN Medical College, Aligarh Muslim University, Aligarh. A sample of 550 was taken from the registered elderly population aged 60 years and above using systematic random sampling with probability proportional to size. Operable cataract was found to be among 343 elderly, and these elderly were assessed for overall coverage and sociodemographic association of cataract surgery. Data were analyzed using SPSS version 20. Tests of proportion, Chi-square test, and multiple logistic regressions were used. $P < 0.05$ was considered as significant. **Results:** CSC was found to be 32.9% in the study population which was significantly associated with age, sex, and SLI. **Conclusion:** The CSC was very low in the study population.


KEY WORDS: Cataract Surgical Coverage; Elderly; Aligarh

INTRODUCTION

Cataract is an important cause of low vision in both developed and developing countries.^[1] Cataract was also identified as the most important and common cause of blindness as per rapid assessment of avoidable blindness (RAAB) in India (58.1%).^[2] As people in the world live longer, the number of people with cataract is anticipated to grow. It is also seen that cataract develops approximately 10–14 years earlier in Indian population than in industrialized countries.^[3] As per UN, the proportion of the aged population (60 + years) in India is expected to increase from 8% in 2000 to 21% in 2050. This

increase in aged population will affect directly the number of people with cataract in the country.^[4] “Vision 2020” initiative of the WHO is committed to the elimination of avoidable blindness especially due to cataract by increasing the number and quality of cataract surgeries to achieve the satisfactory visual outcome and improved the quality of life by the year 2020.^[5]

Cataract surgical coverage (CSC) captures the extent to which services have met the need of the community and gives information on cataract workload in a region/country as being a sensitive and efficient indicator. The cataract surgery (CS) should not be delayed until the total lack of sight, but it must be carried out at the stage of extreme loss of function as a result of decreased vision which will lead to an inability to self-care.^[6] The number of cataract operations performed showed a disparity among various states in India.^[4] In spite of the efforts to achieve set target of CS by the National Program of Control of Blindness in different states, there was a considerable backlog of

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un-operated cases because the growth in infrastructure to deal with cataract blindness has not kept pace with growth in the number of elderly.^[7] The WHO in its recent data showed a 25% decrease in blindness prevalence which could have been due to the increased rates of Cataract Surgical Rate (CSR) and CSC in India.^[8] The control of blindness due to cataract will not be achieved even if is the infrastructure improved unless the factors that hinder the acceptance of CS are identified and remedied.^[9] This study was done with the objective to find out the CSC and its association with sociodemographic factors among the elderly population of Aligarh.

MATERIALS AND METHODS

This study was part of a community-based cross-sectional study carried out among elderly population residing at field practice area of Rural Health Training Centre and Urban Health Training Centre, JN Medical College, Aligarh Muslim University, Aligarh.

Sample Size

The sample size for the study was calculated on the basis of cataract prevalence of 81% reported in a study done by Haq *et al.* in Aligarh.^[10]

$$n = Z^2 p (100 - p) / l^2$$

$$n = (1.96)^2 p (100 - p) / l^2,$$

$$q = 100 - p$$

$$n \sim 4pq / l^2$$

$$p = \text{Prevalence of cataract} = 81\%, q = 100 - p = 19,$$

$$\text{Absolute precision (l)} = 5\%$$

$$\text{Substituting the values- } (4 \times 81 \times 19) \div 5^2$$

$$= 246 + 10\% \text{ non-response}$$

$$= 246 + 25 = 271 \approx 275$$

$$\text{Design effect} = 2$$

Total population to be taken from UHTC and RHTC = $275 \times 2 = 550$ which was sampled using systematic random sampling with probability proportional to size (PPS) (RHTC = 385, UHTC = 165).

Inclusion Criteria

The following criteria were included in this study:

- Individuals aged 60 years and above.
- Those individuals who gave consent.

Exclusion Criteria

The following criteria were excluded from the study:

- Individuals <60 years.
- Individuals who did not give consent.
- Those individuals in whom the lens could not be visualized due to any superficial corneal opacity.

Operational Definition

Operable cataract

A person who was unilateral or bilateral cataract affecting his/her daily routine

CSC was determined for people.

$(a + b) / (a + b + c) \times 100$ where,

a = People with unilateral pseudophakia/aphakia in one eye and operable cataract in the other eye;

b = People with bilateral pseudophakia/aphakia; and

c = People with bilateral operable cataract

The study period was of 1 year from July 201 to June 2015. The data were collected using predesigned and pretested questionnaire using systematic random sampling with PPS. Cataract, pseudophakia/aphakia was identified using a torch with a detailed history. Operable cataract (defined as cataract in both eyes with low vision affecting daily activities) was found to be among 343 elderly, and these elderly were assessed for overall coverage and sociodemographic association of CS. Informed verbal consent was taken from each individual. The nature and consequence of study were explained to them. The study was approved by Institutional Ethics Committee. Data were analyzed using SPSS version 20. Tests of proportion and Chi-square test were used for univariate analysis. Thereafter, multivariable logistic regression model for variables with a $P < 0.05$ obtained in the univariate analysis. $P < 0.05$ was considered as significant.

RESULTS

CSC

CSC was found to be 32.9% in the study population [Table 1].

Association of CS with Various Sociodemographic Factors

According to age group, it was noticed that higher number of the elderly was found operated in the age group 80 years and above (45.5%) followed by age group 70–79 years (41.5%) and age group 60–69 years (29.0%) [Table 2]. The odds of CSC was significantly higher in the age group 80 years and

Table 1: Sociodemographic association of CSC

Characteristics	CS		Total
	No (%)	Yes (%)	
Age of interviewee (year)			
60–69	174 (71.0)	71 (29.0)	245 (100.0)
70–79	38 (58.5)	27 (41.5)	65 (100.0)
80 above	18 (54.5)	15 (45.5)	33 (100.0)
$\chi^2=6.254$ df=2 $P=0.044$			
Sex of interviewee			
Male	93 (58.5)	66 (41.5)	159 (100.0)
Female	137 (74.5)	47 (25.5)	184 (100.0)
$\chi^2=9.842$ df=1 $P=0.002$			
Religion			
Muslim	114 (66.7)	57 (33.5)	171 (100)
Hindu	116 (67.4)	56 (32.6)	172 (100)
$\chi^2=0.023$ df=1 $P=0.879$			
Residence type			
Rural	170 (70.5)	71 (29.5)	241 (100)
Urban	60 (58.8)	42 (41.2)	102 (100)
$\chi^2=4.453$ df=1 $P=0.035$			
Marital status of the interviewee			
Currently married	176 (66.7)	88 (33.3)	264 (100.0)
Widow	54 (68.4)	25 (31.6)	79 (100.0)
$\chi^2=0.078$ df=1 $P=0.779$			
SLI of the interviewee			
Low	69 (75.8)	22 (24.2)	91 (100.0)
Medium	105 (67.7)	50 (32.3)	155 (100.0)
High	56 (57.7)	41 (42.3)	97 (100.0)
$\chi^2=7.017$ df=2 $P=0.030$			
Education of the interviewee			
Illiterate	164 (68.0)	77 (32.0)	241 (100.0)
Primary	31 (68.9)	14 (31.1)	45 (100.0)
High school	20 (62.5)	12 (37.5)	32 (100.0)
Higher secondary	6 (50.0)	6 (50.0)	12 (100.0)
Degree	9 (69.2)	4 (30.8)	13 (100.0)
$\chi^2=2.085$ df=4 $P=0.720$			
Working status of interviewee			
Working	58 (70.7)	24 (29.3)	82 (100.0)
Non-working	172 (65.9)	89 (34.1)	261 (100.0)
$\chi^2=0.659$ df=1 $P=0.417$			
Family type			
Nuclear	126 (69.6)	55 (30.4)	181 (100.0)
Joint	90 (62.5)	54 (37.5)	144 (100.0)
Lives alone	14 (77.8)	4 (22.2)	18 (100.0)

$\chi^2=2.826$ df=2 $P=0.243$. CSC: Cataract surgical coverage, CS: Cataract surgery

above as compared to age group 60–69 years (odds ratio [OR] - 2.8; 95% confidence interval [CI] - 1.3- 6.2) [Table 2].

Females were found to be operated less (25.5%) for cataract when compared to males (41.5%) [Table 2]. Females had significantly lesser odds of CSC as compared to males (OR - 0.45; 95% CI - 0.28- 0.73) [Table 2].

No significant association was observed between religion and the CS in this study and also the operated cataract was found to be almost equal in Muslims (33.5%) compared to the Hindus (32.6%) [Table 2].

More percentage of operated cases of cataract were found in the urban area (41.2%) compared to rural (29.5%) [Table 2]. The odds of CSC among the urban study population was higher as compared to rural population although the result was not significant (OR - 1.6; 95% CI - 0.95- 2.7) [Table 2].

There was no significant association found between marital status and CS in the study population (currently married - 33.3%, widow - 31.6%) [Table 2].

The highest number of operated elderly was reported in high SLI group (42.3%) compared with low SLI (24.2%) [Table 2]. The elderly belonging to high SLI had significantly higher odds of CSC as compared to those belonging to low SLI (OR - 2.2; 95% CI - 1.1–4.6) [Table 2]

The prevalence of cataract was highest in elderly living alone (94.7%) followed by those living in a nuclear family (74.6%) and least among elderly living in joint families (67.5%). This difference in the prevalence of cataract was found to be significantly associated with the type of family [Table 2].

With education of the elderly, the prevalence was almost equal in different groups. The association between educational level and prevalence of CS was not found statistically significant [Table 2].

Working or non-working status of the elderly did not seem to affect the CSC while the significant association was found between surgeries performed and source of expenses for treatment. 36.8% of the elderly found operated among who can bear the expenses by themselves compared to only 1 of 17 elderly who has no source to manage the expenses [Table 2].

Number of operated cases were more among joint (37.5%) and nuclear families (30.4) compared to elderly who were living alone (22.2%). Although the association was not found to be significant [Table 2].

DISCUSSION

This study was part of a community-based cross-sectional study carried out among elderly population residing at field practice area of Rural Health Training Centre and Urban Health Training Centre, JN Medical College, Aligarh Muslim

Table 2: Multivariable logistic regression analysis between CS and age, sex, place of residence and education

Characteristics	CS done	Total elderly with cataract	OR (95% CI)	P value
Age of interviewee (year)				
60–69	71 (29.0)	245 (100.0)	1	
70–79	27 (41.5)	65 (100.0)	1.771 (0.983–3.190)	0.057
80 above	15 (45.5)	33 (100.00)	2.809 (1.267–6.227)	0.011
Sex of interviewee				
Male	66 (41.5)	159 (100.0)	1	
Female	47 (25.5)	184 (100.0)	0.453 (0.281–0.730)	0.001
Residence				
Rural	71 (29.5)	241 (100)	1	
Urban	42 (41.2)	102 (100)	1.600 (0.950–2.694)	0.055
SLI of the interviewee				
Low	22 (24.2)	91 (100.0)	1	
Medium	50 (32.3)	155 (100.0)	1.526 (0.820–2.841)	0.182
High	41 (42.3)	97 (100.0)	2.202 (1.064–4.557)	0.011

OR: Odds ratio, CI: Confidence interval, CS: Cataract surgery, SLI: Standard of Living Index

University, Aligarh. In the present study, CSC was found to be 32.9% in the study population. In the present study, it was also observed that CSC was significantly associated with age, sex, and SLI.

The study done by Nirmalan *et al.* found the lesser prevalence of CS as compared to the present study.^[11] The studies done by some other researchers showed higher surgical coverage than the present study such as Limburg and Foster in community-based surveys found surgical coverage ranged from 42% to 68% for persons.^[12] Bharath *et al.* report the CSC estimates (persons) at the same VA cutoffs as 75.0% and 91.6%.^[13] Murthy *et al.* conducted RAAB survey during 2006–2007 in 16 districts in India reported the CSC for persons as 66.0% and 82.3% at a VA cutoffs of <6/60 and <3/60, respectively.^[14] The lesser coverage in our study compared to other studies may be due to our inclusion criteria of functional disability rather than visual acuity for operable cataract, resulted in higher number of cases with operable cataract.

Similar to this study Bharath *et al.* also reported significantly increased the prevalence of CS with increased age, however, it showed a non-significant association of CSC with sex.^[13] Unlike current study, Nirmalan *et al.* reported inverse association of CSC with illiteracy and with female sex in rural areas.^[11] The reason might be due to people have to reach out far to avail medical services in the rural areas.

CONCLUSION

The study concluded that CSC was low in the study population associated with various sociodemographic factors that warrant the need for improvement in these factors to

reduce the burden of one of the major reasons for avoidable blindness in India.

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