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Study of Socio-demographic Profile and Cataract Surgical Coverage of Geriatric Cataract Patients in a Rural Field Practice Area of a Municipal Tertiary Care Teaching Hospital in Mumbai, India

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ABSTRACT

Introduction: As cataract is a major cause of avoidable blindness, it is necessary to know its magnitude particularly in rural areas where health resources are limited in order to mobilize the resources. Hence the study focused mainly on the socio-demographic profile and cataract surgical coverage in the rural field practice area of a Municipal Tertiary care Teaching hospital in Mumbai. **Methods:** A cross-sectional community based study was carried out amongst 500 geriatric (>60 yrs) cataract patients in rural field practice area of primary health centre attached to municipal tertiary care teaching hospital in Mumbai during the period of August 2015 to July 2016. A semi-structured interview schedule was prepared comprising of socio-demographic determinants. **Results:** Out of total 500 study subjects, 213(42.6%) belonged to the age group of 65-69 years and more than half 256(51.2%) were females. By religion 354(70.8%) were Hindu followed by 97(19.4%) were Buddhist. Majority 365(73.0%) had nuclear family and 228(45.6%) study subjects was illiterate. According to socio-economic classification, 368(73.6%) belonged to lower middle class and only 14(2.8%) were in upper class. Proportion of cataract surgery uptake for males was found to be 62.3% and that for females was 59.5%.**Conclusion:** The study concluded that 42.6% participants were in the age group of 65-69 years and more than half were females and 70.8% were Hindu by religion and only 2.8% belonged to the upper socio-economic class. Majority 73.0% had nuclear family. The unmet need for cataract services in this population was found to be 39.1% (40.4% females and 37.6% males).

Key Words: Socio-demographic profile, Geriatric population, Cataract Surgical Coverage, Tertiary care teaching hospital

INTRODUCTION

In India, there are relatively very few numbers of studies related to the understanding of problems of elderly population. Due to changes in the social scenario and the increasing number of nuclear families, the geriatric people are exposed to emotional, physical and financial insecurities. Mostly, geriatric people depend on their children for their health and social welfare.[1] With this problem, geriatric people will face more dependency after blindness from cataract. It is estimated that the geriatric population which stood at 56 million in 1991 will be doubled by 2016.[2] This increase in population suggests that the population at-risk of blindness due to cataract will also increase enormously.[3] Although a number of studies on cataract are available in several parts of India, only a few studies have been reported on cataract prevalence. Despite cataract being major cause of avoidable blindness, there is no identified effective means of preventing cataract. The only cost effective intervention available is cataract surgery which helps to reduce the major load of avoidable blindness.[4] Cataract surgical rates have increased significantly over the past decade in many low income countries including India. It is the second most cost effective public health intervention following immunization.[5] India as one of the largest developing countries has a huge number of blind requiring sight restoring cataract surgery.[6]

Despite the availability of surgical services, several problems exist for undergoing cataract surgery. They are unable to utilise the available services due to long distance from their village in rural area. . Cataract surgical coverage (CSC) represents the proportion of visually impaired persons with bilateral cataract who were eligible for surgery and who received it. CSC is used to measure the degree to which needs are met by cataract surgical services; at least 85% coverage is required to meet the needs and the burden of a population.[7] Studies in India have revealed that in spite of the rapid increase in the accessibility of quality services resulting in an increased awareness of the benefits of cataract surgery, surgical uptake is still low in the rural areas of the society owing to extensive socioeconomic barriers to accepting surgery.[8]

Geriatric people face a range of problems for undergoing cataract surgery. As the demographic phenomenon of increased proportion of geriatric people would have caused in the recent period, it is required to assess and deal with increased demand for cataract surgical services. Understanding of epidemiological factors related to cataract is equally important which will be useful for healthcare managers.[9] Certainly, there is a need to assess the degree of cataract prevalence among geriatric people in rural area and also understanding their problems and needs for undergoing cataract surgery so as to provide appropriate services for them.

MATERIAL AND METHODS

Study design: Cross-sectional community based study.

Study area: The present study was conducted in a rural field practice area of primary health centre attached to tertiary care hospital. The field practice area of Primary Health Centre consists of 6 subcentres, out of which 3 subcentres were chosen randomly.

Study period: August 2015 to August 2016 [One Year]

Study population: Geriatric persons of age 60 years and above

Inclusion criteria: Persons of age 60 years and above residing in the study area and who have already availed cataract surgery and with difficulty in vision as per history and detected to be having less visual acuity on examination

Exclusion criteria: Individuals having difficulty in vision due to non-cataract causes based on available medical reports and with blindness due to reasons other than cataract. Individuals who are seriously ill, bed ridden with cognitive impairment and also those willing to participate in study

Sample size: Considering 40% prevalence of cataract among geriatric people [10] sample size was calculated using formula, n = 4pqN / 4pq + d2 (N-1) Where, **N** = reference population (2400, which is the Geriatric population of PHC) **p** = prevalence (40%), **q** = (100 – p), **d** = precision (10% of p). Using the formula, 'n' was calculated as 480.(At 95 % confidence interval and considering 10% error for this study) Actual data collection included **500** study subjects.

Sampling method: Multistage sampling

Stage 1: Selection of the 3 subcentres out of 6 using the simple random technique (lottery method)

Stage 2: Selection of the 2 villages under respective subcentres again using the simple random technique (lottery method)

Stage 3: The proportionate sample of geriatric people was selected from subcentre using the convenient sampling method on basis of nearby area of the subcentre.

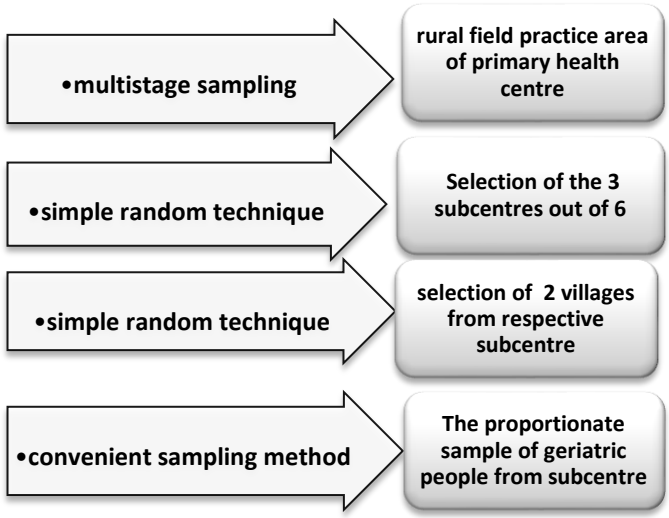
Data collection tool: The sample of geriatric people to be studied was taken from each subcentre by convenient sampling method on the basis of proportion (weightage) of geriatric people of that subcentre. The house to house survey was conducted in selected population. On reaching the house, the nature and purpose of the study was explained to the participant and consent (Enclosure) was obtained. A prior training of 7 days was obtained in primary skills of ophthalmic screening conducted by director of health services under national blindness control programme which included examination of eye using pen torch, diagnose cataract and measure visual acuity. The study was conducted after obtaining ethical clearance by ethical clearance committee of the institution.

Table 1. Sample size plan of the study

Sub-centre	Village	Total population	Expected geriatric population*	Subcentre proportion of geriatric persons#
	a	8368	669	
A	b	518	42	317
		Subtotal=711		
	a	742	59	
B	b	1259	101	72
		Subtotal=160		
	a	2137	171	
C	b	973	78	111
		Subtotal=249		
		Total		500

*Expected geriatric population is calculated as 8% of the total population # Subcentre proportion of geriatric people calculated by formula subtotal geriatric population / total geriatric population x sample size

Figure 1. Multistage sampling



Eye examination was carried out inside the house by oblique focal illumination using a pen torch. The geriatric persons diagnosed with cataract had brought together at subcentre or anganwadi centre depending on availability and accessibility for measuring visual acuity with the help of Snellen's chart. The distant vision was tested by Snellen's illiterate 'E' chart. The visual acuity was tested with the chart at a distance of 6 meters which was measured by a measuring tape. A place with good lighting was chosen. The Snellen's illiterate 'E' chart had hung on the wall and the geriatric persons were asked to tell direction of open side of the letter 'E' (rotation of 'E'). The vision was tested in each eye separately. The eye not being tested was asked to cover. If the persons could not see even the top letters on the chart, he/she was asked to read from a distance of 3 meters. If this was not possible, finger counting and perception of light was tested. The geriatric

persons with cataract and defective vision (≤6/18) were brought up to primary health centre by ASHA workers where they were managed routinely by an ophthalmic assistant and necessary advice had been given and whenever necessary, ophthalmic consultation had been done.

In accordance with the study objective, a semi-structured questionnaire was prepared. This questionnaire was validated and modified after performing a pilot study among the randomly selected geriatric people meeting the eligibility criteria. The semi-structured questionnaire was administered to geriatric people consenting for the study. The age of the geriatric person was verified by crosschecking with any available proof of age like Aadhar card, Election card or ration card. The pretested semi-structured questionnaire was administered to the enrolled geriatric people confirmed as cataract. Information related to demographic profile and socioeconomic status was asked. Patients who had undergone cataract surgery in one or both eyes were verified with the help of available documents and details of cataract surgery were collected. In case, the person had cataract and had not undergone surgery, the reasons for not undergoing surgery were identified. Data was entered in MS Excel sheet and analysed by using percentage and proportions whenever necessary.

RESULTS

As **Table 1** shows that the socio-demographic characterstics of study population, out of 500 study subjects, 213(42.6%) belonged to the age group of 65-69 years followed by 139(27.8%) in the age group of 60-64 years and only 42(8.4%) belonged to more than 75 years age. More than half 256(51.2%) were females followed by 244(48.8%) were males. On religion wise distribution of participants, out of 500 participants, majority 354(70.8%) were Hindu by religion followed by 97(19.4%) were Buddhist and 49(9.8%) were Muslim. Maximum 228(45.6%) study subjects had illiterate followed by 190(38.0%) were studied in primary school, 63(12.6%) studied upto secondary school and only 19(3.8%) learned upto the graduation. Maximum 365(73.0%) had nuclear family followed by 95(19.0%) had joint family and only 40(8.0%) had three generation family. According to the Modified B.G. Prasad's socio-economic classification, majority 368(73.6%) belonged to lower middle class followed by 60(12.0%) were in upper lower class and only 14(2.8%) were in upper class. By occupation wise distribution of subjects, majority 180(36.0%) were semi-skilled followed by 176(35.2%) were un-skilled, 127(25.4%) were un-employed and only 17(3.4%) were skilled.

As **Table 2** depicts that the gender wise percentage distribution of those persons who had already been operated for cataract. In this study, the overall proportion of cataract surgery was found to be 60.8%. It was observed that a slightly higher proportion of males had been operated upon than had females. Proportion of cataract surgery uptake for males was found to be 62.3% and that for females was 59.5%. The unmet need for cataract services in this population was found to be 39.1% (40.4% females and 37.6% males).

Table 1: Socio-demographic Profile of the Study Population

Socio-demographic determinants	Number (n=500)	Percentage
1. Age (in years)		
60 - 64 yrs	139	27.8
65 – 69 yrs	213	42.6
70 - 74 yrs	106	21.2
> 75 yrs	42	8.4
2. Gender		
Male	244	48.8
Female	256	51.2
3. Marital Status		
Married	382	76.4
Widow	118	23.6
4. Religion		
Hindu	354	70.8
Buddhist	97	19.4
Muslim	49	9.8
5. Educational Status		
Illiterate	228	45.6
Primary	190	38
Secondary	63	12.6
Higher Secondary & Graduate	19	3.8
6. Type of Family		
Nuclear family	365	73
Joint family	95	19
Three generation family	40	8
7. Socio-economic status*		
Upper Class (I)	14	2.8
Upper Middle Class (II)	40	8
Lower Middle Class (III)	368	73.6
Upper Lower Class (IV)	60	12
Lower Class (V)	18	3.6
8. Occupation		
Unemployed	127	25.4
Unskilled	176	35.2
Semiskilled	180	36
Skilled	17	3.4

*According to Modified B. G. Prasad Classification

Table 2: Gender wise distribution of persons already operated for cataract in the cataract persons (n=342)

Gender	Operated for cataract		Not operated for cataract		Total
	Number	%	Number	%	
Male	96	62.3	58	37.7	154
Female	112	59.5	76	40.4	188
Total	208	60.8	134	39.1	342

Cataract surgical coverage has been estimated in the study population (As shown in **Appendix 1a)**. Cataract surgical coverage is an indicator of the existing facilities in the study area at a given period. A slightly higher proportion of males had been operated upon than had females. Prevalence of cataract surgery in one or both eyes was 60.8% in the study population. CSC among males and females was found to be 62.3% and 59.5% respectively. The complement of the extent of cataract surgical coverage provides an estimate of the unmet need for cataract services which was found to be 39.2% in overall population (40.5% in females and 37.7% in males).

Appendix 1a: Estimation of Cataract Surgical Coverage for persons by Sex.

Number of cataract surgeries done on persons with cataract by gender in study area

Cataract surgery total	Right eye		Left eye		Both eyes	
	Male	Female	Male	Female	Male	Female
	53	42	11	50	32	20
Total	95		61		52	
	Total surgery done – 208					

CSC for Persons	= Number of persons operated in one or both eyes x 100 Number of persons operated + Number of unoperated cataract persons = 208*100/ (208+134)= 60.81%
CSC for Female	Number of female operated in one or both eyes =112 Number of female with cataract = 188 (76+112) = 112*100/76 = 59.5%
CSC for Male	Number of male operated in one or both eyes = 96 Number of male with cataract = 154 (58+96) = 96*100/15 = 62.3%

Appendix 1b: Estimation of CSC by Eyes and Gender

Number of cataract surgeries done on eyes in study area

Cataract surgery total	Right eye		Left eye		Both eyes	
	Male	Female	Male	Female	Male	Female
	85	62	43	70	32	20
Total	147		113		52	
	Total surgery done- 312					

CSC (Eyes) for Persons	= Eyes operated for cataract x 100 Operated eyes + Unoperated cataract blind eyes = 312*100/(312+379) =312*100/691 = 45. 15 %
CSC (eyes) for Female	Total number of eyes operated for women = 152 Total number of eyes with cataract (women) = 212 = 152*100/364 = 41.75%
CSC (eyes) for Male	Total number of eyes operated for cataract in males = 160 Total number of eyes with cataract in men = 168 = 160*100/328 = 48.78%

The cataract surgical coverage was also estimated according to the number of operated eyes (the estimation is available in **Appendix 1b**). This is an indicator of the total work load, availability of services, accessibility and utilization of cataract surgical services during a given time period. Overall, CSC according to the number of operated eyes was found to be 45.15% (41.75% in females and 48.7% in males). In this study, the cataract surgical coverage was almost similar for both sexes. Accordingly, CSC among eyes is lower than CSC among persons. This indicates that a quite number of persons with need for cataract surgical services are being only partially covered and the unmet need for surgical coverage of cataract eyes is nearly 60%.

DISCUSSION

The present study shows that out of 500 study subjects, 213(42.6%) belonged to the age group of 65-69 years followed by 139(27.8%) in the age group of 60-64 years and only 42(8.4%) belonged to more than 75 years age. Similar findings were observed by Sharma M *et al*[11] found that the proportion of persons with cataract was observed to increase from 69.9% in the age group of 65-74 years to 78.0% in the age group of 75 years and above. Panday M et al[12] observed that ageing is a consistent risk factor for incident visually significant age-related cataract. Study by Sobti S et al[13] and Aarthi R et al[14] reported that there was a significant increase in cataract with increase in age.

In present study, more than half 256(51.2%) were females and 244(48.8%) were males and majority 228(45.6%) study subjects had illiterate followed by 190(38.0%) were studied in primary school, 63(12.6%) studied upto secondary school and only 19(3.8%) learned upto the graduation. Similarly, a study by Sharma M et al[11] demonstrated that cataract is more common in females (76.6%) compared to males (67.3%). A study by Kuruvilla A et al[15] reported that gender prevalence was significantly higher in females. A study by Vashist P et al[16] found a higher prevalence of cataract in women compared to men. This also conforms with other studies reported by Limburg H et al[17], Leske MC *et al*[18], Raizada IN *et al*[19], Chacko A et al[20], and Delcourt CI *et al*[21] where the prevalence of cataract was relatively higher among females than males. In a study by Avachat SS et al[22] cataract was significantly associated with educational status. A study by Nirmalan PK et al[23] found similar results that illiteracy was associated with age related cataract of any type. A study by Sobti S et al[13] reported that lower educational levels were associated with higher prevalence of age related cataract.

According to the Modified B.G. Prasad's socio-economic classification, in our study, majority 368(73.6%) belonged to lower middle class followed by 60(12.0%) were in upper lower class and only 14(2.8%) were in upper class. Similarly study by Ughade SN *et al*[24] & Krishnaiah S *et al*[25] observed significantly higher prevalence of any cataract in the extremely low socioeconomic group. Study by Kuper H *et al*[26] observed that people with visual impairment due to cataract were low socioeconomic group. Another study by Vijaya L et al[27] found that those in the low socioeconomic stratum are less likely to have access to education and health care, resulting in higher blindness rates.

CSC among males and females was found to be 62.3% and 59.5% respectively. The complement of the extent of cataract surgical coverage provides an estimate of the unmet need for cataract services which was found to be 39.2% in overall population (40.5% in females and 37.7% in males). Data is obtained from population based surveys, the most common being the Rapid Assessment of Cataract Surgical Services (RACCS) and the Rapid Assessment of Avoidable Blindness (RAAB).[2]

Conclusion:

There was unequal distribution of geriatric people across the four age-groups. However, the gender wise distribution showed almost identical proportion of male and female. Majority of them belong to Hindu religion followed by Buddhist and Muslim. Most of the study population was married. Most of the study population found have illiterate and most of them were female while most of male had primary education. Most of them belong to lower middle class of socio-economic status by B.G. Prasad SES classification. Most of the female were unemployed while most of the male were unskilled and semiskilled worker. Females were predominantly affected by cataract. Most affected in the age group of above 70 years. Widow/widowed were affected more as compare to married. Most of them were illiterate and followed by educated up to primary school. Most of the affected population belonged to upper lower and lower socioeconomic class by B.G. Prasad SES classification and unskilled worker. The Cataract surgical coverage among persons was more as compared to eyes. This indicates that numbers of persons with need for cataract surgical services are being only partially covered. It was found that most of the study population is not aware of cataract; therefore, it is necessary to educate and encourage them to acquire cataract surgery services before they lose the vision.

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