Prevalence of cataract among adults above 50 years in a rural community of Villupuram, Tamil Nadu

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ABSTRACT

Background: In India, overall prevalence of blindness is 1.1%, the principal cause being cataract (62.6%) affecting over 9 million people. Aim: The present study was carried out to find the prevalence, barriers and facilitating factors related to cataract health services in a rural community of Tamil Nadu. Methods: The study was carried out in four villages in sub-center Kondur, under Primary Health Centre (PHC) Kondur, Villupuram district, Tamil Nadu, during November-December 2010. All adults of more than 50 years (n = 331) residing in the sub-center Kondur, were examined for lenticular opacity and visual acuity. A structured proforma was used to assess the awareness, barriers and facilitating factors related to available cataract health services. Results: The prevalence of cataract among the population studied was 62.8% (95% confidence interval [CI]: 57.5-67.9%). There was a significant increase in cataract with increase in age (P < 0.001). Only 13% (95% CI: 9.6-16.3%) of the persons with cataract were operated at the time of interview. The major barriers were no one to accompany (25.5%) and absence of felt need (22.6%). Less than one-fifth (17.8%) reported the awareness of cataract as a condition affecting eye. The facilitating factors were free surgery in camps (83.7%), self-decision due to defective vision (69.7%) and quality of service provided (65.1%). More than one-half (56.7%) of subjects diagnosed for cataract during the survey were willing to be operated. Conclusion: Prevalence of cataract was high in Kondur PHC area. It is vital to increase the level of awareness regarding the need and availability of cataract health services.

Key words: Barrier, cataract, facilitating factors, prevalence

INTRODUCTION

A cataract is a cloudiness or opacity in the normally transparent crystalline lens of the eye. This cloudiness can cause a decrease in vision and may lead to eventual blindness.[1] Globally, cataract has remained the major cause of blindness over the years. Approximately 45 million people are blind worldwide, out of which cataract accounts for 17.6 million (39%) cases.[2] South East Asian region contributes to 50-80% of all blindness.[2] Data from the rapid assessment during the national blindness survey (2006-2007) put the prevalence of blindness as 8% in individuals above 50 years of age in India.[3] Prevalence of blindness was reported to be 8% in the age group of more than 50 years as per National blindness survey.[3] Cataract accounts for 62.6% of all blindness affecting 9-12 million bilaterally blind persons.[4] In India, an estimated 20 lakhs new cases of cataract is being added to the burden every year.[4]

In Tamil Nadu, the estimated prevalence of cataract per 1000 population was 7.3 and 127,514 new cases of cataract
The prevalence of cataract clearly shows a steep rise ranging from 0.5% above 30 years to 94.5% above 70 years of age. In a study to estimate the prevalence of blindness and its causes among those aged 50 years and above, bilateral cataract was found to be the principal cause (78.7%) in 2007. As per the National Program for Prevention and Control of Blindness (NPCB) survey (2001-02) the prevalence of cataract in Tamil Nadu above 50 years of age was found to be 48%.  

The major barriers for accessing health services revealed a changing trend from attitudinal to service delivery based reasons in a comparative study with a decade gap. Attitudinal barriers like “could manage daily work,” “cataract not mature enough,” “fear of surgery,” “fear of surgery causing blindness,” “female gender,” “old age,” “no one to accompany” were reported than accessibility or cost. Lack of access to personal funds delayed the utilization of cataract services besides stigma, mortality and ageing. Hear-say reports of surgical outcome and quality of services had a strong influence on service uptake. Higher income, higher education, motivation for getting operated from relatives and peer group plays an important role as facilitating factors.

Increased burden of blindness from cataract and felt need of the community regarding cataract services necessitated this study. The objectives were to measure the prevalence of cataract among adults above 50 years and to document the factors influencing availing cataract services.

**METHODS**

A cross-sectional survey was carried for a period of 4 weeks during November–December 2010 in four villages of health sub-center (HSC), Kondur under Primary Health Centre (PHC) Kondur, Kandamangalam Block, Villupuram District, Tamil Nadu. PHC Kondur is located 25 km from Puducherry, 27 km from Villupuram and 180 km from Chennai. Kondur sub-center with a population of 3613 was chosen randomly from among the seven sub-centers under PHC Kondur that provides comprehensive health care to a total population of 27,534. All adults above 50 years of age (n = 369) served by Kondur HSC in four villages namely Kondur, Vellanlakuppam, Aalamarathukuppam, Vadukuppam were included in the study. All these 369 persons formed the study population out of the total of 3,613. Persons who were not resident in the village and those who could not be contacted even after two visits were excluded from the study.

The sample size was calculated to be 108 based on the prevalence of 48% of cataract above 50 years of age with a relative precision of 20% using OpenEpi software (Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version). However, the total population of adults above 50 years in HSC, Kondur was included in this study.

Written informed consent was obtained from the subjects prior to data collection. The proforma was pretested on 30 subjects above 50 years of age in an adjacent sub-center Mittamandagapattu of PHC Kondur to find out cultural appropriateness and suitability and modified accordingly. The parameters studied were the demographic profile, visual acuity, lenticular opacity in one eye or both eyes, cataract surgery/intraocular lens implantation, awareness regarding cataract, barriers and facilitating factors related to cataract health services. The investigator was trained in interview techniques before data collection.

A house-to-house visit in all the four villages of HSC Kondur was conducted. Houses with adults of more than 50 years of age were included in the study and interviewed after explaining the purpose of the study. Visual acuity was also assessed with the help of an illiterate pictorial chart or simplified E chart for those persons who have cataract. Investigator with the help of an ophthalmic assistant posted in the primary health center carried out ophthalmic examination with the help of a hand torch (oblique illumination) after adequate training. Any grayish or whitish discoloration of the lens was diagnosed as cataract.

For the purpose of this study, cataract was defined as the presence of lenticular opacity. Adults were classified as per NPCB guidelines and facility for surgery was arranged in coordination with the Teleophthalmology unit of a tertiary care center in coastal South India.

Data were entered and analyzed with Statistical Package for Social Sciences (SPSS) version11. Categorical data were presented as frequencies and percentages and continuous data as mean with a standard deviation. All statistical analysis was carried out at 5% level of significance, and the P < 0.05 was considered as significant.

The study was approved by Institute Scientific Advisory Committee and ethical clearance was obtained from the Institution Ethics Committee of Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry.

**RESULTS**

Of the total 369 subjects above 50 years, 331 individuals were examined and interviewed. Thirty-eight subjects (10.29%) could not be contacted even after two visits as some had migrated (1.08%), most of them had been
out to contractual jobs (8.4%) and few (0.81%) were dead. The mean age of the study population was found to be 59.7 (±8.1) years. The proportion of male who participated in the study was 79.6% compared to 96.7% females. The details of demographic characteristics are given in Table 1. The male to female ratio in the study PHC was 1:1.9.

Prevalence of cataract, among male and female was 66.9% (95% confidence interval [CI]: 58.2-74.8%) and 60.4% (95% CI: 53.7-66.9%) respectively. The prevalence of un-operated cataract was found to be 62.8% (95% CI: 57.5-67.9%) of which immature cataracts constituted the major proportion of 56.7% (95% CI: 51.4-62%) [Table 2]. More than 1½ (56.7%) of subjects diagnosed for cataract during the survey were willing to undergo surgery. As per NPCB classification 50% of the study subjects had near normal vision, 10.6% had economic blindness, and 12.4% had social blindness [Table 3]. The associations between age and cataract (P < 0.001), education and cataract (P = 0.057), cataract and visual acuity based on NPCB classification of vision (P < 0.001), cataract and vision haziness (P < 0.001), education and motivation factors for increased cataract surgery uptake (P = 0.018) were found to be statistically significant.

Less than one-fifth (17.8%) reported the awareness regarding cataract as a condition affecting eye. Only 13.3% study subjects reported that cataract can be treated by surgery. Less than 5% study subjects reported that they came to know about cataract from family members and health staffs.

Table 4 shows the barriers for accessing health services as reported by the study subjects. Personal attitudinal factors like no one to accompany (25.5%), no felt need (22.6%), were found to be the major reasons. Various factors that facilitated the acceptance of cataract surgery are given in Table 5. Free surgery was found to be the commonest motivating factor (83.2%) followed by self-decision to undergo cataract surgery due to their defective vision (69.7%). Out of 12.9% of subjects who had been operated for cataract, 47.1% had opted for private eye hospital, 22.6% in government institution, and 32% preferred camps for their cataract surgery.

DISCUSSION

Subjects above 50 years of age were studied because the prevalence of cataract and blindness takes a definite steep rise from this age onwards as shown in certain studies.[6,7] As the socioeconomic status of the population in the remaining six sub-centers of PHC Kondur was comparable, the findings of the study could be applied to the other sub-centers of PHC Kondur.

The prevalence of un-operated cataract in the study was 62.8% that is comparable to the National survey on Blindness conducted in various districts in 2001-2002 (63.7%).[7] The rise in the cataract rates above 50 years of age was shown in a study conducted in a rural community of Puducherry that assessed prevalence of cataract in 30 years to be 24.7% and above 50 years as 75.1%.[6] The prevalence of cataract in this study was proportionately higher in males (66.9%) compared to females (60.4%), in contrast to certain studies that shows female preponderance; 61.2% in males and 68.5% in females,[14] 49.1% in males and 54.8% in females.[15] Sexual predilection of cataract toward females was more significant with increasing

### Table 1: Demographic profile of study population (n = 331)

| Variables | Number (%) |
|-----------|------------|
| Sex       |            |
| Male      | 121 (36.6) |
| Female    | 210 (63.4) |
| Age (years) |        |
| 50-59     | 159 (48)   |
| 60-69     | 125 (37.4) |
| ≥70       | 47 (14.10) |
| Type of house |        |
| Pucca     | 60 (18.1)  |
| Semi-pucca| 91 (27.5)  |
| Kuccha    | 180 (54.4) |
| Religion  |            |
| Hindu     | 330 (99.9) |
| Caste     |            |
| OC        | 3 (0.9)    |
| BC        | 42 (12.7)  |
| MBC       | 213 (64.4) |
| SC        | 73 (22.1)  |

### Table 2: Prevalence of cataract in study population (n = 331)

| Gender | Cataract (%) | No cataract (%) | Operated (%) | Total |
|--------|--------------|-----------------|--------------|-------|
| Male   | 81 (66.9)    | 27 (22.4)       | 13 (10.7)    | 121   |
| Female | 127 (60.4)   | 53 (25.2)       | 30 (14.4)    | 210   |
| Total  | 208 (62.8)   | 80 (24.3)       | 43 (12.9)    | 331   |

### Table 3: Distribution of visual acuity among study population as per NPCB guidelines (n = 331)

| Vision                          | Number (%) |
|---------------------------------|------------|
| Normal vision(6/6-6/18)         | 167 (50.1) |
| Low vision(<6/18-6/60)          | 88 (26.6)  |
| Economic blindness(<6/60-NPL)   | 35 (10.6)  |
| Social blindness(<3/60-NPL)     | 41 (12.4)  |

NPL = No perception of light, NPCB = National program for control of blindness
The percentage of economic blindness and social blindness as inferred from the study was 10.6% (35/331) and 12.4% (41/331) respectively, whereas the proportion of economic blindness was 2% and social blindness 3.9% as per NPCB as opposed to 1.7% and 2% as per Rapid Assessment of Avoidable Blindness survey in a district in Tamil Nadu. A similar study in Karnataka to assess the barriers to cataract services in 1995 elicited that over 53% of the responses were related to service delivery, whereas in Madurai in 1986 the proportion was only 32%.

A study had found that stigma, mortality and ageing, lack of access to personal funds, dependency and wider family concept to patient decision were certain barrier factors in a follow-up outreach screening camp. Free surgery in camps and self-decision were the main reasons for accepting cataract surgery. This is followed by the motivation given by the health care providers and family members. Findings in this study has clearly shown that, to effectively increase the utilization of available cataract surgery services in India, future research and programming should consider a broad promotion of services to those most marginalized, such as elderly rural women. Provision of high-quality accessible service can increase the cataract services utilization.

National Program for Control of Blindness (January 2010), targets to conduct 600 cataract surgeries per 100,000 population over 3 years to clear the backlog of blindness induced due to cataract. Applying this target to Kondur HSC with a population of 3613, around 22 cataract surgeries over 3 years will help in a reduction of cataract burden. Around 8–10 cases of visually significant cataract from each HSC can be motivated every year to undergo cataract surgery through counseling and health education. PHC Kondur has seven HSC (total population 27,534); hence a total of 70 cataract cases per year should be targeted for surgery uptake. A coordinated effort will be required from departments of Preventive and Social Medicine and Ophthalmology of JIPMER to meet this backlog. During the study period an eye camp was organized at PHC Kondur, of 57 subjects who attended the camp, 16 were selected for cataract surgery and transported to the tertiary care center; nine were operated by Department of Ophthalmology.

Burden of cataract was inferred to be high in sub-center area of PHC Kondur, Villupuram of Tamil Nadu. Around 70 cataract surgeries, every year for a period of 3 years will reduce the burden of cataract in PHC Kondur, Tamil Nadu.

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### Table 4: Barriers in accessing cataract health services (n = 208)

| Factors                                      | Number (%) |
|----------------------------------------------|------------|
| Personal attitudinal reasons                 |            |
| No one to accompany                          | 53 (25.5)  |
| No felt need                                 | 47 (22.6)  |
| No time/other important job/neglect          | 29 (13.9)  |
| Fear of surgery                              | 6 (2.8)    |
| Medical/service delivery reasons             |            |
| Advised specs/surgery later/drops/control of DM/HT | 19 (9.1)   |
| Other physical illness                       | 13 (6.3)   |
| Lack of awareness                            | 10 (4.8)   |
| Economic reasons                             |            |
| Loss of wages                                | 13 (6.3)   |
| Fear of cost                                 | 7 (3.4)    |
| Cultural belief                              |            |
| Spectacles/drops/medicine sufficient/no treatment required | 4 (1.9) |

DM/HT: Diabetes mellitus/hypertension

### Table 5: Facilitating factors for surgery (n = 43)

| Factors                      | Frequency (%) |
|------------------------------|---------------|
| Free surgery                 | 36 (83.7)     |
| Self-decision                | 30 (69.7)     |
| Quality of service           | 28 (65.1)     |
| Health care providers        | 21 (48.8)     |
| Family members/relatives     | 20 (46.5)     |
| Advice by operated persons  | 7 (16.3)      |

Among the various barrier factors elicited in this study, personal attitudinal reasons like “no one to accompany” (25.5%), “need not felt” (22.6%) were the major barriers. This finding is similar to another study where the barriers for uptake of cataract surgery was reported mainly to be attitudinal reasons. In a study conducted in Madurai in 1986, “need not felt” (24%), “cannot afford” (17%) and “no one to accompany” to the treatment center (25%) were the most important barriers among the study population. Only a small proportion (2%) expressed “waiting for cataract to mature” as a barrier. “Cannot afford” was a barrier for 17% in the Madurai study.
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