

Clinical and Epidemiology

Awareness of eye donation in an urban population in India

Rakhi Dandona BOptom,^{1,2} Lalit Dandona MD MPH,¹ Thomas J Naduvilath MSc,¹ Catherine A McCarty PhD MPH² and Gullapalli N Rao MD¹

¹Public Health Ophthalmology Service, L. V. Prasad Eye Institute, Hyderabad, India and ²Centre for Eye Research Australia, Department of Ophthalmology, University of Melbourne, Melbourne, Victoria, Australia

ABSTRACT

Purpose: Awareness of eye donation and willingness to pledge eyes for donation was assessed in the urban population of Hyderabad, India, where corneal blindness is a significant problem.

Methods: A total of 2522 subjects of all ages, representative of the Hyderabad population, participated in the Andhra Pradesh Eye Disease Study. Subjects >15 years old were interviewed regarding awareness of eye donation and willingness to pledge eyes for donation.

Results: Age-gender-adjusted prevalence of awareness of eye donation was 73.8% (95% CI: 66.5–81.0%) but only 1.9% (95% CI: 0.16–3.66%) had pledged eyes. With multivariate analysis, significantly less awareness of eye donation was found in illiterate subjects (OR 0.1; 95% CI: 0.1–0.14), subjects ≥ 70 years old (OR 0.3; 95% CI: 0.2–0.6), subjects of lower socio-economic status (OR 0.4; 95% CI: 0.3–0.6), females (OR 0.6; 95% CI: 0.5–0.8) and Muslims (OR 0.7; 95% CI: 0.6–0.9). Media was the major source of information about eye donation. Of those aware of eye donation, 44.9% were willing to pledge eyes. Willingness to pledge eyes for donation was significantly lower in Muslims (OR 0.18; 95% CI: 0.13–0.24) than in Hindus and in subjects ≥ 60 years old (OR 0.3; 95% CI: 0.2–0.5).

Conclusions: These data show that although only a few had pledged eyes there is enough potential in this population for obtaining many more corneas for transplantation. The information about distribution and demographic associations of awareness and willingness for eye donation could help in developing strategies to increase procurement of corneas for dealing with corneal blindness.

Key words: awareness, eye donation, India, population-based study.

INTRODUCTION

Corneal problems cause a significant proportion of blindness in the developing world, including India.^{1,2} Although effective strategies to prevent corneal blindness are likely to be more cost-effective, visual rehabilitation by corneal transplantation remains the major treatment for restoring sight in those who already have corneal blindness. It is estimated that only 15 000 donor corneas are procured annually in India, a large proportion of which are unsuitable for transplantation; the requirement of donor corneas per year is at least 20 times the current procurement.³ Shortage of transplantable corneas is common and has been the subject of much attention. Though the factors affecting procurement of corneas and people's attitude towards eye donation have received attention in the developed world in recent years,^{4–8} not much has been published from the developing world.⁹

This study assessed awareness of eye donation and willingness to pledge eyes in an urban population in southern India as part of the population-based Andhra Pradesh Eye Disease Study (APEDS).

METHODS

Detailed methodology of APEDS is reported elsewhere.^{2,10} For the urban segment of APEDS, 2954 subjects were sampled in Hyderabad city. Before the clinical examination, subjects >15 years old responded to a structured questionnaire on eye donation administered by trained field investigators.¹⁰ Awareness was defined as having heard of eye donation; knowledge was defined as having some understanding about eye donation. Only those subjects who were aware of eye donation were asked about their willingness to pledge eyes for donation.

Table 1. Responses of the 1293 subjects who had awareness of eye donation

Response	No. of responses (%)
What is the donated eye used for?	
To replace another eye	686 (53.1)
To replace a part of another eye*	140 (10.8)
To replace the cornea of another eye*	135 (10.4)
Don't know	327 (25.3)
Others	5 (0.4)
How did you come to know about eye donation?	
Doctor	29 (2.3)
Eye camp	14 (1.1)
Family member/friend/relative needing transplantation	36 (2.8)
Family member/friend/relative not needing transplantation	101 (7.8)
TV, magazines or other media	1071 (83.3)
Others	34 (2.6)

*Considered as knowledge.

The demographic associations of awareness and willingness for eye donation were assessed together with age, gender, education, socio-economic status and religion using univariate analyses followed by multiple logistic regression. The effect of each category of a multicategory variable was assessed by keeping the first or the last category as the reference. Analyses were done using SPSS (Release 7, 1995; SPSS Inc., Chicago, IL, USA) software. Adjustment of the estimates for the age and gender distribution of the Hyderabad population was made.¹¹ Based on the rates in each cluster, the design effect of the sampling strategy was calculated for the estimates¹² and 95% confidence intervals adjusted accordingly.

RESULTS

A total of 2522 subjects were interviewed in Hyderabad, representing a participation rate of 85.4%. 1859 (73.8%) subjects were >15 years old. Data were analysed for 1843 subjects (data were missing for 16 subjects), of which 1015 (55.1%) were females and 1159 (62.9%) Hindus.

Table 2. Effect of age, gender, education, socio-economic status and religion on awareness of eye donation by multiple logistic regression

	Total	Aware n (%)	Odds ratio for being aware (95% CI)
Age group (years)			
16–29	452	353 (78.1)	2.31 (1.25–4.26)
30–39	465	347 (74.6)	3.31 (1.82–6.03)
40–49	395	272 (68.9)	2.44 (1.35–4.44)
50–59	256	171 (66.8)	2.95 (1.57–5.53)
60–69	183	111 (60.7)	2.45 (1.29–4.65)
≥70	92	43 (46.7)	1.00
Gender			
Male	828	665 (80.3)	1.00
Female	1015	632 (62.3)	0.67 (0.51–0.88)
Education (category)			
I	561	186 (33.2)	1.00
II	278	184 (66.2)	3.46 (2.51–4.77)
III	497	446 (89.7)	14.1 (9.87–20.4)
IV	171	159 (93.0)	18.7 (9.82–35.8)
V	24	23 (95.8)	24.1 (3.17–184.2)
VI	191	184 (96.3)	31.0 (13.7–69.7)
VII	112	111 (99.1)	94.1 (13.2–671.5)
Socio-economic status (category)			
I	168	86 (51.2)	1.00
II	652	371 (56.9)	0.99 (0.66–1.49)
III	772	615 (79.7)	1.71 (1.11–2.62)
IV	202	193 (95.5)	4.95 (2.10–11.6)
Religion			
Hindu	1159	836 (72.1)	1.00
Muslim	641	422 (65.8)	0.70 (0.54–0.92)
Others	43	39 (90.7)	0.90 (0.26–3.07)

Education categories: I, no education; II, primary schooling (class 1–5); III, intermediate schooling (class 6–10); IV, secondary schooling or technical course or a diploma holder after class 10; V, undergraduate (college); VI, advanced studies (postgraduate, professional). Socio-economic status categories based on per capita income per month in rupees: I, ≤200; II, 201–500; III, 501–2000; IV, ≥2000.

Responses to the awareness questionnaire are presented in Table 1. 1293 (70.1%) subjects were aware of eye donation. Age-gender-adjusted prevalence of awareness was 73.8% (95% CI: 66.5–81.0%; design effect 13.1). The

Table 3. Responses of the 1288 subjects for willingness to pledge eyes for donation

	No. of responses (%)
'Are you willing to donate your eyes?'	
I have already pledged my eyes	28 (2.2)
Yes, I am willing to donate my eyes	554 (43.0)
No, I am afraid of deformity of the body after death	31 (2.4)
No, I will be born blind in the next birth	2 (0.2)
No, due to religious reasons	245 (18.9)
No, because I have an eye problem	58 (4.5)
No, I do not believe it will be useful	25 (1.9)
No, due to other reasons	15 (1.2)
I need more information to decide	330 (25.5)

source of information for awareness of eye donation was media in 83.3% subjects; 275 (21.2%) subjects had knowledge about eye donation (Table 1). On applying multiple logistic regression (Table 2), awareness of eye donation was significantly lower in illiterate subjects (OR 0.1; 95% CI: 0.1–0.14), subjects ≥ 70 years old (OR 0.3; 95% CI: 0.2–0.6), subjects of lower socio-economic status (OR 0.4; 95% CI: 0.3–0.6), females (OR 0.6; 95% CI: 0.5–0.8) and Muslims (OR 0.7; 95% CI: 0.6–0.9).

Of 1843 subjects, only 28 (2.2%) had pledged eyes, an age-gender-adjusted prevalence of 1.9% (95% CI: 0.16–3.66%; design effect 7.9).

Responses to the willingness questionnaire for 1288 subjects (data were missing for five subjects) are presented in Table 3. 554 (43%) subjects were willing to pledge eyes for donation, an age-gender-adjusted prevalence of 44.9% (95% CI: 37.4–52.5%; design effect 11.2). 330 (25.5%) needed more information to decide whether or not to pledge their eyes. On applying multiple logistic regression (Table 4), willingness to pledge eyes was significantly lower

Table 4. Effect of age, gender, education, socio-economic status and religion on willingness to pledge eyes for donation by multiple logistic regression

	Total	Willing* n (%)	Odds ratio for being willing (95% confidence interval)
Age groups (years)			
16–29	350	183 (52.3)	4.50 (1.98–10.23)
30–39	345	167 (48.4)	2.97 (1.32–6.72)
40–49	271	124 (45.9)	3.12 (1.37–7.10)
50–59	171	69 (40.4)	2.52 (1.08–5.89)
60–69	111	30 (27.0)	1.29 (0.53–3.18)
≥ 70	43	10 (23.3)	1.00
Gender			
Male	662	313 (47.4)	1.00
Female	629	269 (42.9)	0.86 (0.66–1.11)
Education (category)			
I	185	73 (39.3)	1.00
II	184	58 (31.5)	0.60 (0.37–0.96)
III	443	197 (44.5)	1.08 (0.72–1.62)
IV	159	71 (44.7)	1.10 (0.66–1.85)
V	23	13 (56.5)	1.27 (0.48–3.36)
VI	184	99 (53.8)	1.31 (0.79–2.19)
VII	109	70 (64.2)	1.77 (0.98–3.19)
Socio-economic status (category)			
I	86	37 (43.5)	1.00
II	370	150 (40.7)	0.86 (0.50–1.48)
III	612	274 (44.8)	0.90 (0.53–1.53)
IV	192	103 (53.6)	0.83 (0.45–1.54)
Religion			
Hindu	833	474 (56.9)	1.00
Muslim	420	81 (19.3)	0.16 (0.12–0.22)
Others	38	28 (73.7)	2.01 (0.94–4.31)

*Includes 28 subjects who had already pledged.

in Muslims (OR 0.18; 95% CI: 0.13–0.24) than in Hindus and in subjects ≥ 60 years old (OR 0.3; 95% CI: 0.2–0.5).

DISCUSSION

Hyderabad, in India, is a city of 3.5 million people where approximately 5000 people are blind due to corneal problems.² Corneal procurement rates are inadequate to meet the transplantation needs. For example, the average waiting period for corneal transplantation at L. V. Prasad Eye Institute, a tertiary eye care centre, is 1 year. Under-utilization of the potential to obtain corneas is obvious as 73.8% of this population was aware of eye donation but only 1.9% of these had pledged their eyes. We speculate that this level of awareness is a recent phenomenon because at the time of this study the Eye Bank Association of India had just started using the then 'Miss World' to promote eye donation. It is also probable, therefore, that the media featured strongly as the source of information. Knowledge about what the donated eyes are used for was poor despite reasonable awareness of eye donation.

Even though 44.9% of those aware of eye donation were willing to pledge eyes, they had not done so yet. Another quarter wanted more information before deciding. People ≥ 60 years old were less willing to pledge eyes even though they were aware of eye donation. This is of significance because people ≥ 60 years old are more likely to die sooner than those < 60 years old. Muslims were less willing to pledge eyes for religious reasons; there are differing opinions about whether the Muslim religion forbids the donation of eyes.

To translate this awareness into pledging and procurement of eyes, knowledge about eye donation must be increased. Several factors are associated with obtaining consent for the procurement of eyes. The consent of family members for the donation is needed at the time of death, even if the deceased is a pledged donor. Prior knowledge about eye donation and the use of donated eyes could help to increase the level of consent of families. Another factor that could increase the procurement of corneas would be a legal obligation of

hospital staff to request eye donation on death of a patient. In India, there is currently no legislation to this effect.

In the long term, the optimum public health approach would be to reduce the occurrence of corneal blindness with effective preventive strategies, but in the short term the main way to deal with corneal blindness is to procure more corneas for transplantation. For this, the public should be made aware of how to become a pledged eye donor and how this pledge can be translated into actual eye donation. More public education is needed in this area as it would probably make the public's attitude to eye donation more favourable and this would facilitate an increase in the number of corneas available for transplantation.

ACKNOWLEDGEMENTS

This study was supported by the Hyderabad Eye Research Foundation, Hyderabad, India. Ms Rakhi Dandona is supported in part by the R B McComas scholarship from the University of Melbourne. The authors gratefully acknowledge Professor Hugh R Taylor of the University of Melbourne for guidance in the design of APEDS; Drs VN Naidu and Pyda Giridhar and Messrs Kovai Vilas and MNKE Prasad for interviewing the subjects. The authors thank all subjects for taking part in the study.

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