

Original Research Article

Eye donation: awareness, knowledge and willingness among general public in Southern Indian population

Srinivasa Reddy Pallerla^{1*}, Rohit C. Khanna², S. Krishnaiah², Jill Keffe²

¹Andhra Pradesh Right to Sight Society, Hyderabad, Telangana, India

²LV Prasad Eye Institute, Hyderabad, Telangana, India

Received: 04 May 2022

Revised: 18 May 2022

Accepted: 19 May 2022

*Correspondence:

Dr. Srinivasa Reddy Pallerla,

E-mail: srinivasar107@hotmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Aim of the study was to assess the awareness, knowledge and willingness to donate eyes among general public in southern Indian states of Andhra Pradesh and Telangana.

Methods: A cross sectional population-based survey used a semi structured questionnaire on awareness, knowledge and willingness for eye donation. Stratified multistage cluster random sampling method was used with a sample size of 867 adults ≥ 16 years based on, estimated awareness of cataract 70%, assuming an expected rate of 85%, design effect of 1.5, margin of error 4% with 95% confidence interval with 25% from urban areas and 75% from rural areas. Having heard of eye donation was defined as awareness and having knowledge of the ideal time to donate the eyes was considered as knowledge. A pilot study was conducted to validate the questions used in the main study. Statistical package SPSS (version 19) was used for analysis to calculate logistic regression and odds ratios for gender, age, education and urban-rural areas.

Results: A total of 782/867 (90.1%) subjects participated in the survey with females 47.4%. 603 subjects (77.1%) were aware of eye donation. 301 subjects (38.5%) were willing to donate eyes. The 297 subjects (49.3%) were aware of the ideal time for donation after death.

Conclusions: Awareness of eye donation was high among the general public but the willingness to donate eyes was poor. There is a need to identify barriers for eye donation to increase the voluntary donation of the eyes to combat corneal blindness.

Keywords: Awareness, Knowledge, Willingness, Eye donation, General public

INTRODUCTION

Corneal blindness accounts 9% of all blindness according to Andhra Pradesh eye diseases study.¹ The prevalence of unilateral blindness due to corneal opacity in low-income settings is estimated to be in the range of 5000 to 20000 people per million populations. Many factors like availability and standards of eye care influence the corneal disease among the population.² The incidence of corneal ulcerations in Madurai district in south India was 113 per 100000 people. The abuse of topical steroid eye

drops in conjunctivitis and keratitis leading to corneal ulceration and ultimately resulting in corneal scar and blindness is higher in developing countries. The other causes of corneal blindness include trauma, ulceration, childhood corneal blindness, trachoma, and use of traditional eye medicines.^{3,4} Visual rehabilitation by corneal transplantation remains the major treatment for restoring sight in people with corneal blindness.

According to the eye bank association of India the current corneal procurement rate in India is 22000 per year.⁵ It is estimated that a significant proportion of donor corneas

are unsuitable for corneal transplantations. Based on current ratio of available safe donor eyes India needs 200000 donor eyes to perform 100000 corneal transplantations in a year. To increase the procurement of corneas raising the awareness levels of general public, eye health education is an important step. The factors affecting procurement of corneas and public attitude towards eye donation have received much attention in the developed world but not in a developing world.⁶

To reduce the gap between demand and supply of corneas, it is necessary to increase the awareness levels of the community and to overcome barriers for eye donation. Barriers to corneal donation reported include religious and cultural view, objections from family members, associated health problem effecting the eye donation and concerned about disfigurement and mutilation.⁷

We report the awareness of eye donation, knowledge of ideal time for donation and willingness for eye donation among both urban and rural population of southern India.

METHODS

The detailed methodology followed in the present study was already published earlier.⁸

This study was approved by the ethics committee of LV Prasad eye institute as part of the broader research study on impact of implementation of blindness control activities in Southern Indian States of Andhra Pradesh and Telangana and was conducted in accordance with the principles of declaration of Helsinki. The survey was based on stratified multistage cluster sampling strategy, and conducted from 1st March 2015 to 30th June 2015. The inclusion criteria were all persons ≥ 16 years and all persons below 16 years were excluded. This was cross sectional study conducted on general population from one urban and three rural areas of two South Indian states of Andhra Pradesh and Telangana with the aim of having study sample representative of urban and rural area population of both the states.

The sample size determined based on estimated awareness of eye donation in urban population (70%) as per APEDS study, assuming an expected rate of 85%, design effect of 1.5, margin of error 4% with confidence interval of 95% sample size came to 867 subjects out of sample size 867 subjects, a quarter of (217) subjects for each of the 4 areas selected (1 urban and 3 rural area).⁵

The questionnaire had two sections, with the first section including questions on awareness, knowledge and

willingness for eye donation. The second section had questions on the demographic profile of the subjects (age, gender, educational level and occupation). The subjects were given the questionnaire to fill in and if the subject was illiterate, he/she was asked to respond to questions narrated by the investigator. Having heard of eye donation taken as 'awareness' and having understanding of ideal time for eye donation taken as 'knowledge'.

A pilot study was conducted on 50 participants before the main study. The Cronbach's Alpha for the questions on awareness, knowledge and willingness for eye donation was 0.14 (95% CI=0.0, 0.40). When willingness for eye donation variable has been dropped the Cronbach's Alpha was 0.31 (95% CI=0.21, 0.40). With the experience of the pilot study, questions were modified so that they were easily understood in the local language without losing the meaning. The data were entered in excel and statistical package SPSS version 19.0 was used for data analysis. The Multiple logistic regression was used to ascertain the association between awareness and willingness of eye donation to individual characteristics-age, gender, education level, urban and rural, and occupation. All p values are reported and significance level was $p < 0.05$.

RESULTS

Out of sample size of 867 subjects, 782 subjects participated in the study (90%). The 371 (47.4%) were females. The average age of the subjects is 40.2 years ranging from 16 to 93 years (Table 1), 603 subjects (77.1%) are aware of eye donation. The 297 subjects (49.3%) had corrected knowledge of ideal time for eye donation after death. Responses to the question when the eyes can be donated are presented in Table 2. The source of information for awareness of eye donation was electronic media (39.1%). Of the 782 subjects, only 301 (38.5%) are willing to donate their eyes. Among the subjects willing for eye donation 81.7 % were literates.

With multiple logistic regression about awareness of eye donation with various variables (Table 3), females had higher awareness of eye donation (OR=1.8, CI=1.2-2.6) and also among the educated-1st to 10th class (OR=1.5, CI=1.0-2.2), 11th and above (OR=4.1, CI=2.1-8.0) (Hosmer and Lemeshow test goodness of fit=0.45). Multiple logistic regression about willingness of eye donation with various variables shows that those who are educated 11th class and above have higher willingness for eye donation (OR=1.9 CI=1.2-3.3) (Table 4) rural area subjects less willing for eye donation (OR=0.2, CI=0.1-0.3) (Hosmer and Lemeshow test goodness of fit=0.001). We chose to remove occupation variable as education surrogate mother of occupation in multivariate analysis.

Table 1: Demographic profile of study participants (n=782)*.

Variables	Agriculture	Business	Student	Employee	Labourer	House-wife	Others	Total
Age group (years)								
16-39	80	15	103	60	124	24	1	407
40-59	72	4	0	51	98	24	0	249

Continued.

Variables	Agriculture	Business	Student	Employee	Labourer	House-wife	Others	Total
≥60	48	1	1	7	60	5	2	124
Gender								
Male	107	19	70	91	120	0	3	410
Female	93	1	34	27	162	53	0	370
Education								
Illiterate	80	0	0	5	124	10	0	219
1-10 th class	117	4	6	19	140	31	1	318
≥11 th class	3	16	98	94	18	12	2	243
Location								
Urban	2	19	70	82	5	37	2	217
Rural	198	1	34	36	277	16	1	563

*Data from two participants missing.

Table 2: Responses to the question: Do you know when eyes are to be donated, (n=602).

Time period	No. of people who are aware of time for eye donation	Percentage (%)
Before death	42	7.0
Within 6 hours	297	49.3
Within 12 hours	106	17.6
Within 1 day	74	12.3
Don't know	83	13.8

Table 3: Multiple logistic regression showing association between willingness for eye donation and various variables, (n=301).

Variables	Willingness, (n)	Odds ratio	P value
Age group (years)			
16-39	180	1.00	
40-59	87	0.883 (CI=0.604-1.291)	0.521
≥ 60	34	0.843 (CI=0.511-1.391)	0.504
Gender			
Male	178	1.00	
Female	123	0.955 (CI=0.683-1.337)	0.790
Education			
Illiterate	54	1.00	
1-10 th class	91	1.087 (CI=0.722-1.636)	0.689
≥ 11 th class	155	1.968 (CI=1.165-3.323)	0.011
Location			
Urban	155	1.00	
Rural	146	0.204 (CI=0.132-0.314)	0.0001

Table 4: Multiple logistic regression showing association between awareness of eye donation and various variables, (n=782).

Variables	Awareness, (N)	Odds ratio	P value
Age group (years)			
16-39	403	1.00	
40-59	244	0.880 (CI=0.58-1.33)	0.546
≥60	119	0.867 (CI=0.52-1.44)	0.578
Gender			
Male	402	1.00	
Female	364	1.820 (CI=1.26-2.64)	0.002
Education			
Illiterate	213	1.00	
1-10 th class	312	1.490 (CI=1.00-2.22)	0.049
≥11 th class	241	4.106 (CI=2.10-8.02)	0.000
Location			
Urban	213	1.00	
Rural	553	0.577 (CI=0.32-1.05)	0.073

Table 5: Comparison of awareness about eye donation and willingness to donate eyes in different studies and the present study.

Study (year)	Place of study	Study type	Awareness eye donation (%)	Willingness to donate eyes (%)
Present study (2015)	Southern India	Adults > 16 years	77.1	38.5
Patil et al (2012)¹⁵	Rural health and training Centre (RHTC), Seliamedu, Pondicherry, India	Adults visiting RHTC (18-40 years)	80.6	
Ronanki et al (2011)¹³	Srikakulam, Andhra Pradesh, India	Adults 20-52 years (Health assistants, trainee students, teachers, social workers)	93.0	82.0
Bhandary et al (2007)¹²	Melaka, Malaysia	Attendants of the patients visiting out patient department of the general hospital (aged 18-75)	69.0	34.4
Priyadarshini et al (2001)¹¹	India	Adults 35-80 years (patients attending outreach clinics)	50.6	
Krishnaiah et al (1996-2000)⁹	India	Adults > 15 years	28.0	32.9
Dandona et al (1996-1999)⁵	India	Urban population adults > 15 years	70.1	43.0

DISCUSSION

Data from our study shows 77.1% of the population were aware of eye donation, but only 38.5% of them are willing for eye donation. Knowledge of eye donation was poor despite reasonable awareness of eye donation. This shows that there is inadequacy of media publicity on eye donation in this population. To transform the awareness to willingness to donate requires concrete steps to overcome the barriers. The awareness levels for eye donation were quite high in the present study (77.1%) compared to the similar studies done in India and elsewhere (Table 5).⁹

Eye donation awareness levels similar to our study was reported from eastern part of Singapore by Yew et al while it was less in studies reported by Priyadarshini et al from south India (50.7%) and Bhandary from Malaysia (69.0%).¹⁰⁻¹² In a study by Ronanki et al in Andhra Pradesh, overall 93% awareness was found among the female health assistant trainee students, teachers, social workers and kin of the family members who had earlier donated the corneas.¹³

The major source of information regarding eye donation in present study was electronic media similar to findings by Dandona et al, Krishnaiah et al, Bhandary et al, Ronanki et al, but in study conducted by Priyadarshini B et al main source of knowledge was publicity campaigns.^{1,9,11-13}

In the present study 49.3% of respondents were aware about the ideal timing to donate the eyes after death, for a population to be aware of such medical matter shows high

awareness. In a study by Priyadarshini et al only 4.3% knew about time to donate eye, whereas in a study by Ronanki et al in Andhra Pradesh 64.8% participants were aware about ideal timing of eye donation.^{11,13} This high awareness was probably due the different subjects, which included teachers, students, social workers and kin of family members who donated eye. In a study about faith leaders (like priest) and eye donation by Gogate et al it was found that the persons of faith have an important role to make eye donation a real possibility.¹⁴ Thus, community leaders and key stakeholders can play an important role in motivating community people for eye donation.

In conclusion the data from the present study shows high awareness of eye donation and reasonable knowledge of ideal time for donation. The willingness for eye donation levels has to be increased to increase the procurement of the corneas to reduce the gap between the demand and supply of corneal tissues.

There are limitations to the present study that need to be considered when interpreting the results. The study sample was small and for those participants who were illiterate the interpreter marked the responses which may also influence the data. Notwithstanding these limitations, the results indicate that the study population had a higher level of awareness of eye donation.

Funding: Government of Andhra Pradesh and Andhra Pradesh Right to Sight Society

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee by LV Prasad Eye Institute

REFERENCES

1. Dandona L, Dandona R, Srinivas M, Giridhar P, Vilas K, Prasad MN et al. Blindness in the Indian state of Andhra Pradesh. *Invest Ophthalmol Vis Sci*. 2001;42(5):908-16.
2. Smith GT, Taylor HR. Epidemiology of corneal blindness in developing countries. *Refract Corneal Surg*. 1991;7(6):436-9.
3. Thylefors B. Epidemiological patterns of ocular trauma. *Aust N Z J Ophthalmol*. 1992;20(2):95-8.
4. Whitcher JP, Srinivasan M. Corneal ulceration in the developing world--a silent epidemic. *Br J Ophthalmol*. 1997;81(8):622-3.
5. Dandona R, Dandona L, Naduvilath TJ, McCarty CA, Rao GN. Awareness of eye donation in an urban population in India. *Aust N Z J Ophthalmol*. 1999;27(3-4):166-9.
6. Diamond GA. Obtaining consent for eye donation. *Am J Ophthalmol*. 1987;103(2):198-203.
7. Verble M, Darcy K, Penta JG, Worth J. Telephone requests for donation: concerns expressed by families and the impact of the donor registry. *Prog Transplant*. 2013;23(1):92-8.
8. Pallerla SR. Public knowledge, attitudes and practices related to eye diseases in Southern Indian population. *Int J Community Med Public Health*. 2020;7(12):4993.
9. Krishnaiah S, Kovai V, Nutheti R, Shamanna BR, Thomas R, Rao GN. Awareness of eye donation in the rural population of India. *Indian J Ophthalmol*. 2004;52(1):73-8.
10. Yew YW. Knowledge and beliefs on corneal donation in Singapore adults. *Br J Ophthalmol*. 2005;89(7):835-40.
11. Priyadarshini B. Awareness of eye donation in an adult population of southern India. A pilot study. *Indian J Ophthalmol*. 2003;51(1):101-4.
12. Bhandary S. Eye donation-awareness and willingness among attendants of patients at various clinics in Melaka, Malaysia. *Indian J Ophthalmol*. 2011;59(1):41-5.
13. Ronanki VR, Ramachandran BP, Jalbert I. Awareness regarding eye donation among stakeholders in Srikakulam district in South India. *BMC Ophthalmol*. 2014;14:25.
14. Gogate BP, Gogate B, Deshpande M. Eye donation programme through faith leaders. *Br J Ophthalmol*. 2008;92(6):867-8.
15. Patil R, Prasath RE, Boratne A, Gupta SK, Datta SS. Status of eye donation awareness and its associated factors among adults in rural pondicherry. *J Clin Diagn Res*. 2015;9(2): LC01-4.

Cite this article as: Pallerla SR, Khanna RC, Krishnaiah S, Keeffe J. Eye donation: awareness, knowledge and willingness among general public in Southern Indian population. *Int J Community Med Public Health* 2022;9:2474-8.