

Awareness and Knowledge on Eye Donation Among University Students

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SUMMARY

Four hundred (400) students studying first year Medicine, Dentistry, Laboratory Technology, Pharmacy, Biomedicine and Bioengineering degree courses in the University of Malaya were assessed on their awareness and knowledge on eye donation using an open ended questionnaire. The majority of the students (344, 86%) in this study were aware about eye donation; the awareness was higher in biomedical (77.1%) and medical students (76.7%) compared to the others (55.9% - 70.7%). One hundred and eight students (27%) were willing to donate their eyes. Most of the students (376, 94%) did not know about any eye bank in Malaysia. One hundred and sixty (40%) students were aware that whole eye can be removed from the donor and 101 (25.25%) were aware that the cornea can be removed separately. However, only 121 (30.25%) knew that donated eyes were used for corneal grafting. More than half of the students (231, 57.7%) did not know that the donor eye could be stored before transplantation. The results of this study indicate that there is a need to educate the young adults in our society about corneal transplantation so that they can in turn motivate other members of society and their own family members to become eye donors, thus facilitating the availability of donor corneas for corneal transplantation in Malaysia.

KEY WORDS:

Eye donation, Awareness, Knowledge, Corneal transplantation

INTRODUCTION

Corneal diseases (corneal ulcer, trauma, bullous keratopathy following cataract surgery, keratoconus, corneal dystrophies and trachoma) constitute significant causes of visual impairment and blindness worldwide, especially in developing countries^{1,2}. Corneal transplantation offers the potential for sight restoration to those who are blind from corneal diseases. The number of patients waiting for corneal transplantation is growing due to insufficient number of eye donations in Malaysia. Eye donations are dependent on people willing to pledge their eyes for donation and on relatives to honor that pledge upon the death of the person. In Malaysia, the majority of donor cornea is obtained from USA and Sri Lanka because procurement of local donor eyes is low. Raising the level of understanding about eye donation among the public through health education is an important step to achieve more local eye donations.

A literature search by the authors revealed only two studies on eye donation among student populations in the Asia

Pacific region^{3,4} and none among the student population in Malaysia. This study was undertaken to assess the awareness and knowledge on eye donation among the students studying first year degree courses (Medicine, Dentistry, Laboratory Technology, Pharmacy, Biomedicine and Bioengineering) in the University of Malaya. The students were chosen for this study because they are young, well educated adults undergoing training in the life sciences and related professions with access to newspapers, magazines, movies, internet and television (TV) and should be better informed about eye donation when compared to other groups in society.

MATERIALS AND METHODS

All students studying in the first year degree course (Medicine, Dentistry, Laboratory Technology, Pharmacy, Biomedicine and Bioengineering) in the University of Malaya, aged 20 years, were assessed on their awareness and knowledge on the eye donation, using a standard open ended questionnaire (Table I). Nursing students in the first year of the degree course already have a diploma in nursing and were assumed to have sufficient knowledge on eye donation, and hence were excluded from the study. This study was conducted in the Department of Anatomy in consultation with the Department of Ophthalmology, Faculty of Medicine, University of Malaya, over a period of three months (August to October 2004). All the students present in the class were enrolled after explaining the purpose of the study and obtaining their verbal consent. The questionnaire was administered to the students after finishing the teaching session. Students were told to write the answers they knew for the questions mentioned in the questionnaire form. All the students present in the class at the time of distribution of questionnaire responded. The students' responses to the questions were analyzed using SPSS version 9 programme.

RESULTS

Out of 400 students assessed, there were 103 medical, 82 dental, 83 laboratory technology, 50 pharmacy, 48 biomedical and 34 bioengineering students, all of whom were 20 years of age and in the first year of their degree course. They represented 60.2%, 94.2%, 92.2%, 100%, 92.3%, and 75.5% of the total number of students of the respective degree courses.

Table II summarizes the students' awareness on eye donation. Three hundred and forty-four students (86%) were aware about the existence and practice of eye donation. The major

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source of information was from the mass media/ TV/radio/ movies (71%). One hundred and eight (27%) students were keen to pledge their eyes for donation, while 132 (33%) of them were willing to donate their close relative's eyes. However, 136 (34%) of them did not know whom to approach for pledging their eyes for donation. Two hundred and eighty five students (71%) knew that the eye is removed by a doctor/surgeon/eye specialist. Most of the students (376, 94.0%) were not aware about the existence of eye banks in Malaysia. Table III summarizes the students' knowledge on eye donation. One hundred and twenty-six students (31.5%) were aware that the eye can not be donated while a person is alive. More than half the number of students (58.25%) did not know this fact. Only 115 (28.75%) students knew that the eyeball should be removed within few hours after death. One hundred and sixty students (40%) were aware that the whole eye can be removed from the donor while 101 (25.25%) were aware that the cornea can be removed separately. However, only 121 (30.25%) of them were aware that donated eye can be used for corneal grafting. Two hundred and thirty-one students (57.75%) did not know that the donor eye can be stored before transplantation.

DISCUSSION

Corneal transplantation in Malaysia dates back to the 1970's. Today it is widely performed by ophthalmologists throughout the country both in the government and private sectors⁵. Despite the long queue of patients waiting for corneal transplant, only 192 surgeries were performed in Malaysia in 2005. This can be attributed to the lack of local donations. According to the National Transplantation Registry Report of Malaysia 2005, the majority of corneal tissues were obtained from USA (71%) and to a lesser extent from Sri Lanka (17%); only 12% of corneal tissues were from local donors⁵.

A donor cornea from USA would cost more than 350 US dollars for the patient, which makes it beyond the affordability of below average income Malaysians. To a large extent, the lack of local donors can be attributed to the lack of national awareness of corneal transplantation and eye donation. Although 86% of the total students in our study had heard about eye donation previously, only 27% of them were willing to pledge their eyes for donation, and 33% of them were willing to donate their relatives' eyes. These findings suggest that more health education should be given to the students during their secondary school education on the importance of eye donation and benefits of corneal transplantation so that they will be motivated to pledge their own eyes for donation as well as to motivate their relatives to do the same. A reason why students were more willing to pledge their close relatives' eyes than their own could be that the students felt they were too young to pledge their own eyes as compared to their relatives who were old. In our study, even though 261 (65.25%) students knew that either whole eye (40%) or cornea (25.25%) is removed from the donor, only 121 (30.25%) knew that cornea is transplanted from the donor eye, while more than half the students (231, 57.75%) did not know that the donor eye can be stored before transplantation. The whole eye removed from the donor can be stored in the refrigerator (moist chamber technique) up to 48 hours before transplantation, while the

corneoscleral button taken from the donor eye and preserved in Optisol medium can be stored up to 14 days before transplantation.

The prevalence of awareness of eye donation has been reported to be 73.8% in urban population in India⁶ and 80.7% in Singaporean adults⁷ which is much less than our study population of university students (86%). The awareness and knowledge on eye donation and the willingness to become eye donors appears to be much better among medical students in India than medical students in Malaysia (Table IV). In our study, only 33% of medical students knew that the eye can only be donated after death as compared to 99.4%⁴ and 79.6%³ of medical students in India. Similarly the knowledge that cornea is used for transplantation is much higher among medical students in India (86%⁴, 100%³) when compared to our medical students (31%).

To increase the level of awareness and knowledge of community on eye donation, more health education about eye diseases, eye donation and corneal transplantation is needed. This can be achieved by educating practicing doctors on the importance of eye donation and benefits of corneal transplantation and training them to motivate the families of ill patients to pledge for eye donation. Medical students have great potential to increase eye donation. They come in contact with many patients and therefore have a great opportunity to motivate the patients or relatives to donate eyes. In addition to this, utilization of the mass media to increase coverage of eye care education and eye donation campaigns will also help to increase the frequency of eye donation.

University students in the life sciences represent a young, well educated, active group that can potentially influence opinion, especially on sensitive issues such as organ donation. Well informed students in non-medical fields may also influence the eye donation rate by motivating the public in whichever field they work in future life. In our study, 86% first-year university students were aware about the existence and practice of eye donation. However, 94% were not aware of the existence of eye banks in Malaysia. The functions of eye banks are the collection, processing, storage and distribution of donor eyes. To our knowledge, currently there are two functioning eye banks in Kuala Lumpur city (one in Hospital Kuala Lumpur and another in Tun Hussein Onn National Eye Hospital).

The general public are aware through newspapers and television that living people are donating kidney and liver to their relatives who are in need of them. In this context, the students were asked to respond to the question "Can the eye be removed from the living person for donation?" Surprisingly, more than half of the students (233, 58.25%) answered 'yes'. To the best of our knowledge, there is no law in any country which permits the removal of an eye from a living person (relative or other person) for donation even with the person's consent. The laws in most countries state that even if the person has pledged, while alive, to donate his/her eyes after death, the eyes or corneas cannot be removed from the dead body unless the next of kin or relative gives consent for the donation of eyes.

Table I: Data collection questionnaire on awareness and knowledge of eye donation

Faculty: medical/ dental/ laboratory technology/ pharmacy/ biomedical/ bioengineering
 How did you come to know about eye donation?
 Are you willing to donate your eyes?
 Are you willing to donate your close relative's eyes?
 Whom do you approach for eye donation?
 Who should remove the eye from the donor?
 Name any eye bank that you know in Malaysia?
 Can the eye be removed from a living person for donation?
 Within how much time after death should the eyes be removed?
 What is removed from the donor eye?
 What is transplanted from the donor eye?
 How long the donor eye can be kept/stored before transplantation?

Table II: Responses to questionnaire - Awareness of eye donation

Questions	Medical n=103 No. (%)	Dental n=82 No. (%)	Lab.techno n=83 No. (%)	Pharmacy n=50 No. (%)	Biomedical n=48 No. (%)	Bioengine n=34 No. (%)	Total n=400 No. (%)
1. How did you come to know about eye donation?							
Mass media/TV/radio/movies	79 (76.69)	58 (70.73)	56 (67.46)	35 (70)	37 (77.08)	19 (55.88)	284 (71.00)
Don't know	12 (11.65)	11 (13.41)	7 (8.43)	9 (18)	3 (6.25)	5 (14.71)	47 (11.75)
Through this form	1 (0.97)	3 (3.66)	4 (4.82)	1 (2)	0 (0)	0 (0)	9 (2.25)
Hospital/clinics	3 (2.91)	1 (1.22)	2 (2.41)	1 (2)	0 (0)	3 (8.82)	10 (2.50)
Organ donation campaigns	2 (1.94)	2 (2.44)	11 (13.25)	1 (2)	5 (10.42)	1 (2.94)	22 (5.50)
Through lecture	1 (0.97)	2 (2.44)	1 (1.20)	2 (4)	3 (6.25)	3 (8.82)	12 (3.00)
Friend	3 (2.91)	0 (0)	1 (1.20)	0 (0)	0 (0)	1 (2.94)	5 (1.25)
Doctor	2 (1.94)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.50)
Did not answer/left blank	0 (0)	5 (6.09)	1 (1.20)	1 (2)	0 (0)	2 (5.88)	9 (2.25)
2. Are you willing to donate your eyes?							
Yes	34 (33.01)	11 (13.41)	26 (31.33)	18 (36)	12 (25.00)	7 (20.59)	108 (27.00)
No	55 (53.4)	37 (45.12)	42 (50.6)	14 (28)	21 (43.75)	21 (61.76)	190 (47.50)
Don't know	9 (8.74)	25 (30.49)	11 (13.25)	7 (14)	7 (14.58)	5 (14.71)	64 (16.00)
Maybe/ need time	5 (4.85)	9 (10.98)	4 (4.82)	11 (22)	8 (16.67)	1 (2.94)	38 (9.50)
3. Are you willing to donate your close relative's eyes?							
Yes	38 (36.89)	19 (23.17)	35 (42.17)	17 (34)	12 (25.00)	11 (32.35)	132 (33.00)
No	47 (45.63)	34 (41.46)	27 (32.53)	16 (32)	19 (39.58)	14 (41.18)	157 (39.25)
Don't know	13 (12.62)	13 (14.63)	7 (8.43)	5 (10)	7 (14.58)	3 (8.82)	48 (12.00)
Maybe/ need time	5 (4.85)	16 (19.51)	14 (16.87)	12 (24)	10 (20.83)	6 (17.65)	63 (15.75)
4. Whom do you approach for eye donation?							
Hospital/ society	17 (16.50)	27 (32.93)	22 (26.51)	10 (20)	14 (29.17)	10 (29.41)	100 (25.00)
Doctor	8 (7.77)	2 (2.44)	7 (8.43)	5 (10)	2 (4.16)	4 (11.76)	28 (7.00)
Specialist	0 (0)	1 (1.22)	23 (27.71)	1 (2)	1 (2.08)	0 (0)	26 (6.50)
Don't know	43 (41.75)	35 (42.68)	16 (19.28)	15 (30)	19 (39.58)	8 (23.53)	136 (34.00)
Parent/ close family	26 (25.24)	14 (17.07)	4 (4.82)	14 (28)	8 (16.67)	9 (26.47)	75 (18.75)
Eye bank	9 (8.74)	1 (1.22)	9 (10.84)	5 (10)	4 (8.33)	3 (8.82)	31 (7.75)
Did not answer/left blank	0 (0)	2 (2.44)	2 (2.41)	0 (0)	0 (0)	0 (0)	4 (1.00)
5. Who should remove the from the donor?							
Eye specialist	33 (32.04)	28 (34.14)	29 (34.94)	16 (32)	0 (0)	16 (47.06)	122 (30.50)
Doctor/ surgeon	55 (53.40)	41 (50.00)	31 (37.35)	22 (44)	0 (0)	14 (41.08)	163 (40.75)
Optometrist	7 (6.80)	4 (4.88)	1 (1.20)	1 (2)	27 (56.25)	0 (0)	40 (10.00)
Don't know	2 (1.94)	2 (2.44)	4 (4.82)	3 (6.25)	3 (6.25)	1 (2.94)	15 (3.75)
Any one	0 (0)	1 (1.22)	1 (1.20)	2 (4)	14 (29.17)	0 (0)	18 (4.50)
Did not answer/left blank	6 (5.82)	6 (7.32)	17 (20.48)	6 (12)	4 (8.33)	3 (8.82)	42 (10.50)
6. Name any eye bank that you know in Malaysia?							
Don't know	98 (95.15)	75 (91.46)	77 (92.77)	46 (92)	48 (100.00)	32 (94.12)	376 (94.00)
HKL/ Tun Hussein Onn	1 (0.97)	1 (1.22)	5 (6.02)	0 (0)	0 (0)	2 (5.88)	9 (2.25)
Did not answer/left blank	4 (3.88)	6 (7.32)	1 (1.20)	4 (8)	0 (0)	0 (0)	15 (3.75)

Table III: Responses to questionnaire - Knowledge of eye donation

Questions	Medical n=103 No. (%)	Dental n=82 No. (%)	Lab.techno n=83 No. (%)	Pharmacy n=50 No. (%)	Biomedical n=48 No. (%)	Bioengine n=34 No. (%)	Total n=400 No. (%)
1. Can the eye be removed from a living person for donation?							
Yes ...	57 (54.34)	45 (54.88)	41 (67.47)	32 (64)	24 (50)	22 (64.71)	221 (55.25)
Yes with consent of donor ...	2 (1.94)	1 (1.22)	2 (2.41)	1 (2)	3 (6.25)	3 (8.82)	12 (3.00)
No ...	34 (33.01)	19 (23.17)	35 (42.17)	12 (24)	18 (37.50)	8 (23.53)	126 (31.50)
Don't know ...	7 (6.79)	15 (17.07)	5 (6.02)	4 (8)	3 (6.25)	0 (0)	34 (8.50)
May be ...	3 (2.91)	2 (2.44)	0 (0)	1 (2)	0 (0)	1 (2.94)	7 (1.75)
2. Within how much time after death should the eyes be removed?							
Don't know ...	39 (37.86)	35 (47.56)	29 (34.94)	27 (54)	25 (52.02)	11 (32.35)	166 (41.50)
Hour/few hours ...	32 (31.06)	28 (39.02)	16 (19.28)	6 (12)	21 (43.75)	12 (35.29)	115 (28.75)
Within 24 hours/week ...	13 (12.62)	2 (2.44)	11 (13.25)	7 (14)	1 (2.08)	2 (5.88)	36 (9.00)
As soon as possible ...	16 (15.53)	12 (19.51)	9 (10.84)	5 (10)	1 (2.08)	3 (8.82)	46 (11.50)
Not sure ...	1 (0.97)	4 (4.88)	6 (7.23)	4 (8)	0 (0)	2 (5.88)	17 (4.25)
Did not answer/left blank ...	2 (1.94)	1 (1.22)	2 (2.40)	1 (2)	0 (0)	4 (11.76)	10 (2.50)
3. What is removed from the donor eye?							
Don't know ...	22 (21.36)	19 (23.17)	19 (22.89)	15 (30)	13 (27.08)	9 (26.47)	97 (24.25)
Whole eye ...	42 (40.78)	24 (29.27)	38 (45.80)	20 (40)	18 (37.50)	18 (52.94)	160 (40.00)
Cornea ...	27 (26.21)	26 (31.71)	15 (18.07)	12 (24)	16 (33.33)	5 (14.71)	101 (25.25)
Eye/lens ...	9 (8.74)	3 (3.66)	1 (1.20)	3 (6)	1 (2.08)	1 (2.94)	18 (4.50)
Retina/sclera/tissues ...	3 (2.91)	10 (12.20)	10 (12.05)	0 (0)	0 (0)	1 (2.94)	24 (6.00)
4. What is transplanted from the donor eye?							
Don't know ...	42 (40.78)	28 (34.15)	26 (31.33)	24 (48)	18 (37.50)	10 (29.41)	148 (37.00)
Retina ...	7 (6.80)	8 (9.76)	7 (8.43)	2 (4)	0 (0)	5 (14.71)	29 (7.25)
Whole eye ...	21 (20.39)	11 (25.61)	31 (37.35)	9 (18)	12 (25.00)	5 (14.71)	89 (22.25)
Cornea ...	32 (31.07)	31 (39.02)	14 (16.87)	13 (26)	17 (35.42)	14 (41.18)	121 (30.25)
Iris/lens/any part ...	1 (0.97)	4 (1.22)	5 (6.02)	2 (4)	1 (2.08)	0 (0)	13 (3.25)
5. How long the donor eye can be kept/stored before transplantation?							
Don't know ...	51 (65.85)	54 (65.85)	40 (48.19)	36 (72)	29 (60.42)	21 (61.76)	231 (57.75)
Up to 6 hours ...	3 (2.91)	0 (0)	6 (7.23)	3 (6)	4 (8.33)	1 (2.94)	17 (4.25)
7 – 12 hours ...	5 (4.85)	10 (12.20)	1 (1.20)	3 (6)	3 (6.25)	0 (0)	22 (5.50)
Up to 24 hours ...	13 (12.62)	9 (10.98)	12 (14.46)	4 (8)	6 (12.50)	2 (5.88)	46 (11.50)
Few days /few weeks ...	16 (15.53)	5 (6.09)	13 (15.66)	1 (2)	5 (10.42)	3 (8.82)	43 (10.75)
Few months/ few years ...	11 (10.68)	2 (2.44)	11 (13.25)	2 (4)	1 (2.08)	4 (11.76)	31 (7.75)
As soon as possible ...	4 (3.88)	0 (0)	0 (0)	1 (2)	0 (0)	3 (8.82)	8 (2.00)
Did not answer/left blank ...	0 (0)	2 (2.44)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.50)

Table IV: Comparison of awareness and Knowledge on eye donation between Malaysian Medical Students and Indian Medical Students

	Present study (n=103) first year students		Singh <i>et al</i> ⁴ (n=180) first year students		Dhaliwal ³ (n=49) final year students	
	No.	(%)	No.	(%)	No.	(%)
Eyes can be donated after death ...	34	(33)	179	(99.4)	39	(79.6)
Pledging for donation of own eyes ...	34	(33)	157	(87.2)	43	(87.8)
Willing to donate close relatives eyes ...	38	(36.9)	not available		37	(75.5)
Do not know about any eye bank ...	98	(95.1)	16	(32.6)	not available	
Whole eyeball/cornea is removed from the donor ...	69	(67)	not available		42	(85.7)
Cornea is used for transplantation ...	32	(31.1)	155	(86.1)	49	(100)
Donor eye can be stored up to 24 hours ...	21	(20.4)	not available		31	(63.3)

CONCLUSION

The National Corneal Transplantation Registry 2005 report showed only 12% of the cornea transplantations were from local eye donations within Malaysia. The lack of local eye donations should be taken seriously and measures must be taken by all the concerned governmental and non-governmental organizations to improve this situation so that needful patients can be transplanted at an affordable cost without waiting for long periods.

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