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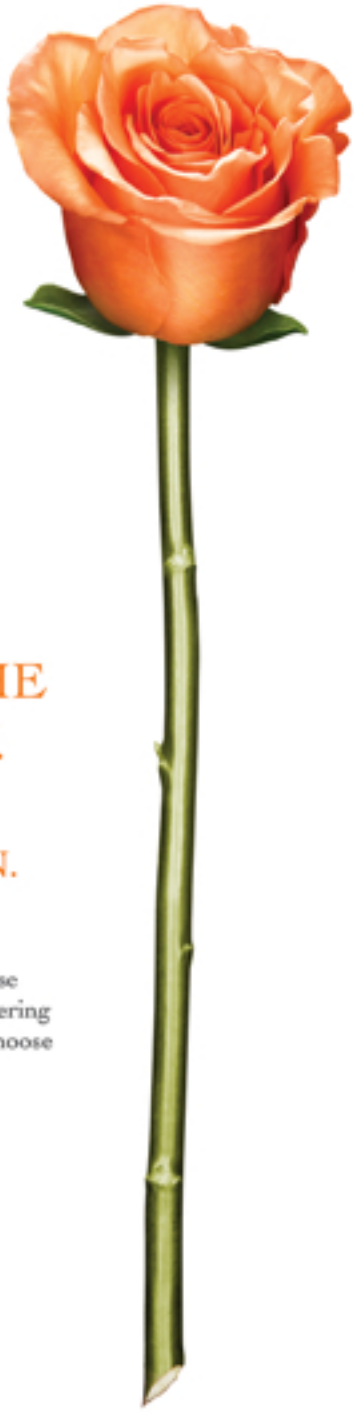

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Awareness and perception of budding doctors: A focal scenario on eye donation

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Abstract

Background: *Diseases affecting the cornea constitute a major cause of blindness. Corneal transplantation offers the potential for sight restoration. Due to non-availability of healthy cornea, many people continue to live in a dark world.*

Objectives: *To assess the awareness and perception of undergraduate medical students towards eye donation.*

Methods: *A cross-sectional study was conducted among undergraduate medical students of Kolkata on August 2010 using a pre-designed, pre-tested, semi-structured, self-administered questionnaire. The data were analyzed using Epi-info software package version 6.04.*

Results: Almost all (98.9%) participants knew that eyes can be donated and 70.8% were aware at the time of eye collection. However, only 43.7% respondents knew whom to approach for pledging their eyes for donation; 80.7% were either willing (76.0%) or had already pledged (4.7%) to donate their eyes. Television was the major source (78.1%) of information on eye donation. Nobility was the main motivation (87.7%) and 75.5% felt the need for helping the blind. Of these medical students, 19.3% were unaware and did not pledge eye donation due to objection by family members and dislike of the idea of separating their eyes.

Conclusion: *The present study revealed that medical students were well aware of eye donation with a favorable attitude towards it and most of them were inclined to pledge for eye donation. The perceived reasons for not donating eyes need to be considered while creating awareness about eye donation in the community. Students can be actively involved as volunteers in eye donation campaigns and after proper training in counselling techniques, they can act as counsellors for eye donation activities.*

Key words: *Blindness, corneal transplant, eye donation, medical students*

Introduction

Using the definition of blindness from International Classification of Diseases 10 (Update and Revision 2006),[1] globally the number of visually impaired is estimated to be 285 million, 39 million of whom are blind and 246 million have moderate to severe visual impairment. In the South-East Asia Region (SEAR) of the World Health Organization (WHO), apart from India, 27.9 million people are visually impaired,

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3.9 million of whom are blind and 23.9 million have low vision. In India alone, 62.6 million people are visually impaired, 8 million of whom are blind and 54.5 million have low vision.[2] The different causes of blindness in India are cataract (62.6%); refractive errors (19.7%); glaucoma (5.8%); corneal pathologies (0.9%).[3] The prevalence of blindness is 0.6% and the prevalence of low vision is 2.0%.[4]

In West Bengal, the prevalence rate of blindness has been lowered from 1.49% to 0.63% and the goal (0.3%) is expected to be achieved by the year 2020.[5]

Diseases affecting the cornea constitute a major cause of blindness worldwide, second only to cataract in overall importance. According to WHO it is the fourth cause of blindness globally, after cataract, glaucoma and age related macular degeneration.[2] The global causes of corneal blindness are: trachoma, xerophthalmia and ophthalmia neonatorum, onchocerciasis, leprosy and the use of harmful traditional eye medicines.[6] Corneal transplantation offers the potential for sight restoration to those who are blind from corneal diseases and two persons can be benefitted from a single donor. In spite of this, it is a sad fact that due to non-availability of healthy cornea many people continue to live in a dark world. The WHO reports that corneal blindness affects more than ten million people worldwide, but only 100,000 receive corneal transplants each year.[7,8]

As many as three million people can benefit from corneal transplantation in cases where lack of awareness is the hindrance.[9] One hundred thousand corneas are needed, but only about 10,000 are collected in India. [10] Only 30% of donated eyes are used; the rest are either discarded for not being in good shape or sent to medical colleges for educational purposes.[11] Until 2010, there was an upward trend in the number of corneal donations.[12] The number of corneas harvested dropped in 2010-11.[13] If only half the deaths in India would be leading to corneal donation, the waiting list could be done with in just months.[14] Eye donation fortnight is being organized in this country from 25th August to 8th September each year for last 27 years.[15]

Medical students are the budding physicians of the future who constitute a major potential force to increase the rate of eye donation. They have the opportunity to counsel and motivate the patients and their relatives to donate eyes. To do this, they themselves should be well aware of the need of eye donation, the success of eye transplantation and proper utilization of corneal tissue. Very few studies have been conducted on this topic among medical students in India and in West Bengal, including Kolkata.

In this context, the present study was conducted to assess the awareness and knowledge of undergraduate medical students of tertiary care hospitals towards eye donation and corneal transplantation and the willingness to donate eyes.

Materials and methods

Type of study: observational, descriptive.
Study design: cross-sectional.
Places of study: IPGMER and Midnapore Medical College, Paschim Medinipur, West Bengal.

Study population: 400 MBBS students of medical colleges. A convenient sampling technique was followed.
Study tool: pre-designed and pre-tested semi-structured self-administered questionnaire.
Outcome variables: student's knowledge and awareness regarding social and technical aspects of eye donation and corneal transplantation; their intension to donate eyes.
Explanatory variables: demographic details, perceived reasons for eye donation by donors, perceived reasons for not donating eyes and sources of information.
Study duration: included preparatory phase and designing and pre-testing of the questionnaire, data collection, analysis of data and report writing and it required one month time duration. The study was conducted in August 2012.
Data collection was done through a self-administered questionnaire. The students were approached, requested to provide data and explained on the issue of anonymity and privacy. Three hundred eighty-four students responded correctly without missing information.
Inclusion criteria: All the students who were present and gave the consent on the days of data collection.
Exclusion criteria: The students who refused to answer the questionnaire and who were unavailable at the time of data collection (three attempts).
Data management and statistical analysis: Data collection was done by way of self-administered questionnaires. Compilation in the master sheet, tabulation, analysis, interpretation was done through Epi-Info software package version 6.04. Proportion was calculated.
Ethical committee approval: The study got permission from the principals and a proposal has been sent to the ethical committee for approval. The study was carried out according to the ethical guidelines for biomedical research on human subjects (2000).

Results

Of the 400 students, 384 responded correctly in the study (response rate 96%). The respondents belonged to the age group of 19 to 21 years. Two hundred sixty-four were male (68.7%), 120 were female (31.3%).

The relevant responses on knowledge about eye donation by the 384 medical students were considered in the study. Almost all participants (98.9%) were aware of the existence and practice of eye donation and knew that eyes can be donated only after death. Ideally eyes should be collected within six hours of death and that is fairly well known to 70.8% students. Only 25% of the students knew that 70 years is the ideal donor age limit for corneal transplantation. Of the students, 54.6% were aware that after death the donor's eyes should be kept closed while waiting for the donation. The students were not very well informed about the transportation and storage of the donated eyes, with the medium of transportation known to only 34.4% students. The respondents were somewhat aware of the ocular (49.4%) and systemic contra-indications (87.5%) of eye donation (Table 1).

Table 1. Responses to the questionnaire – awareness and knowledge on eye donation (n = 384).

Characters	Number responded	Percentage
Eyes can be donated only after death	380	98.9
Ideal time for collection of donated eyes is within six hours after death	272	70.8
Person who can give consent	334	87.0
Knows institution where to be contacted for eye donation	168	43.7
Name some eye banks of Kolkata	124	32.3
Age limit of donor for corneal transplantation	96	25.0
Knows that after death donor's eye should be kept closed	210	54.6
Knows which part of eye is removed	330	86.0
Knows which part of eye is transplanted	352	91.6
Knows medium of transportation	132	34.4
Knows that eye can be stored up to 24 hours	218	56.8
Knows how storage time can be prolonged	194	50.5
Knows ocular contra-indications of cornea transplantation	190	49.4
Knows systemic contra-indications of eye transplantation	336	87.5

The study revealed that 90.6% agreed that there was shortage of eye donors in India and 80.7% were either willing (76%) or had already pledged to donate their eyes (4.7%).

Different knowledge (eye shortage, willing to donate) was seen among the participants (Table 2). Television was the major source of information on eye donation for 78.1% students (Table 3).

The specification of perceived reasons for eye donation by the donors was assessed. Noble intentions (87.7%) was the main motivation for donation and 75.5% felt the need for helping the blind (Table 4).

The specification of the 19.3% medical students who would not pledge their eyes for donation was identified with respect to the reasons for not doing so. Their

views about lack of eye donation were variable with a majority (74.7%) citing lack of awareness as the main reason (Table 5).

Table 2. More responses bordering on knowledge of eye donation/corneal transplant (n = 384).

Characters	Number responded	Percentage
Knows a person who has donated eyes	68	17.7
Knows someone who has received a donated eye	00	0
Willing to donate eyes	292	76.0
Already pledged to donate eyes	18	4.7
Willing to donate close relative's eyes	270	70.3
Knows there is an eye shortage in India	348	90.6
Awareness about selling and buying of donor eyes	60	15.6

Table 3. Source of information on eye donation (n = 384).*

Source	Number	Percentage
Television Radio	300 32	78.1 8.3
Newspaper	272	70.8
Magazines	176	45.8
Posters	106	27.6
Friends/Neighbors	156	40.6
Relatives	106	27.7
Doctor	76	19.8
Hospitals	14	3.6
Pamphlets	90	23.4
Seminars/Lectures	04	1.0
Family members	52	13.5
Nurse	14	3.6
Health workers	94	24.5

***Multiple Responses**

Table 4. Distribution of perceived reasons for donating eyes by donors (n = 310).#

Perceived Reason *	Number	Percentage
Eye donation is a noble work	272	87.7
Gives pleasure to help the blind	234	75.5
To set an example	72	23.2
To get popularity	04	1.3
A friend/relative has donated eye A friend/relative has received a donated eye	64 00	20.6 0.0
Impressed after reading an article	96	30.9
Impressed after attending a seminar/ lecture	80	25.8
Impressed after seeing a movie	42	13.5

 # Included students who have either pledged or are willing to donate eyes.
*** Multiple Responses**

Table 5. Distribution of perceived reasons for not willing to donate eyes (n = 74).*

Perceived reason	Number	Percentage
Lack of awareness	56	74.7
Objection by family members	20	27.0
Feels body ill-treated by eye donation	08	10.8
Religious restrictions	12	16.2
Unsuitability to donate eyes due to health problems	10	13.5
Dislike of separating eyes from the body	14	18.9
Signing eye donation card is like signing death certificate	06	8.1
Corneal transplant gives poor result	00	0.0

*** Multiple Responses**

Discussion

There are an estimated 4.6 million corneal blind people in India and 20,000 new victims join yearly. The good news is that almost 66 percent of the cases are preventable or curable if basic precautions are taken. Thus as many as 3 million people

can benefit from corneal transplantation. Yet, no more than 5000 corneal grafts are performed annually. The reason? Lack of awareness![9] In a *New York Times* article in 2008, the president of the International Agency for the Prevention of Blindness, Dr. Nag Rao, said that in India 100,000 corneas are needed for transplants each year, but only about 10,000 are collected each year – and fewer than 5000 transplant operations are being performed annually.[10] According to the Union health ministry's own analysis, only 30% of donated eyes are used for treatment of corneal blindness. The rest are either discarded for not being in good shape, or sent to medical colleges for educational purposes.[11]

Until 2010, there was an upward trend in the number of corneal donations.[12] Despite the growing spread of awareness campaigns, the country has registered a dip of 3.5% in the number of corneal donations in the last year, according to the latest government statistics. The number of corneas harvested dropped from 46,589 in 2009-10 to 44,926 corneas in 2010-11.[13]

In fact, in India, an average of only 38,000 corneas are donated annually, thus it will take 112 years for all corneal blind in India to get new corneas. If only half the deaths in India led to corneal donation, the waiting list could be wiped out in just months.[14] It was found that of the total number who pledged to donate their eyes, less than 1% was actually donated finally, according to Union Health ministry officials (August 26, 2011).[11] 'Eye donation fortnight' is organized from 25th August to 8th September every year to promote eye donation. Gujarat, Tamilnadu, Maharastra, Delhi, Chandigarh, Andhra Pradesh, Kerala and Karnataka are at the forefront of this activity.[15] Targets for 11th five year Plan (Indian plan system for development activities) is to collect 260,000 donated eyes (after death) for transplantation in persons with corneal blindness.[16] West Bengal collected 2152 eyes in 2010 according to Union Health Ministry Officials.[11]

As early as 1905, doctors had discovered that corneal blindness could be cured by carrying out a corneal transplant. In most countries, especially in the developing ones, the numbers of corneas available do not meet the demand. In order to increase the potential for eye donation it may be imperative to promote awareness among potential donors and healthcare workers.[27] Post-graduation medical students might serve as terminal care doctors of suitable eye donors; they would have a great opportunity to motivate patients or relatives to donate eyes.[23]

Data from the present study suggest that the level of awareness on eye donation/corneal transplant among these students were high, as 98.9% students were aware that eyes can be donated only after death which was corroborative with the findings of some other studies in Delhi,[17] Bangalore,[18] Ahmedabad,[19] Brahmapur,[20] Karnataka,[21] and Nagpur.[22] However, the rate was somewhat lower (79.6%) in another study among final year medical students of Delhi by Dhaliwal U,[23] 86% among University students of Malaysia,[24] 81% among secondary level students of North Kolkata[25] and only 27.5% among medical students of Nigeria.[27] Information by mass media could be related to the high level of awareness in these study participants.

When the study population were asked about the time of collection of cornea, a correct answer was given by 70.8 % of students of this study, which was almost

similar to the Delhi study (63.35%) on medical students[23] and the Karnataka study (61%) on college students including medical students.[21] The corresponding figures were only 41.1% in Delhi,[17] 32.8% in Bangalore,[18] 40.0% in Nagpur,[22] 32.1% in North Kolkata[25] and 37% in Kolkata.[26] Lack of knowledge of this aspect on the part of doctors would result in unnecessary wastage of potential donor tissue. But it was encouraging that the Brahmapur study,[20] the Ahmedabad study[19] and the Nigeria study[27] revealed that 90% of the medical students were aware of the ideal time of removing donated eyes (after death). In this study, 43.7% respondents knew about the appropriate place of contact for an eye donation; which was higher than the Delhi study (27.2%),[17] the Bangalore study (32.9%),[18] and the Nagpur study (29.3%)[22]; but lower than the study by Nekar , et al. (74.1%),[21] Dhaliwal (61.2%),[23] Jena, et al. (83.6%)[20] and Sarkar et al. (66%).[26]

In the present study, 90.6% of the medical students agreed that there is a shortage of eye donors in India and 76.0% students were willing to donate their eyes, whereas 4.7% had already pledged for eye donation. This represents a total of 80.7%; corresponding with some other studies on medical and nursing students.[17-22] This was a very encouraging feature which could motivate unwilling and undecisive individuals by showing the merits of eye donation.

Nobility was the prime reason (87.7%) followed by pleasure to help the blind (75.5%) felt by the willing donors of this study, a result that was almost similar to some other studies.[17,18,21,22]

The reasons for lack of eye donation were variable as perceived by the unwilling respondents. Of this study population, 74.4% told that lack of awareness was the main reason for people not to donate eyes. Similar results were obtained from other studies.[17-22] Other reasons included objection by family members, body ill-treated by eye donation, religious restrictions, health problems, dislike of separating eyes from the body, etc. Other studies revealed similar reasons.[17-19,21,22,27]

If these students were well-informed about eye donation and corneal transplant, they could be expected to influence eye donation rates. Television was the most important source of information on eye donation (78.3%) revealed from the present study. According to other studies also, television was the major source of information.[17,18,20,21,24-26]

Using mass media to increase the awareness regarding corneal blindness and eye donation to treat it is not enough. There is a great need to educate students, as they are an important part of our society. If they are educated about the preventive and curative aspects of corneal blindness, they can spread the message among their friends and family members, thus acting as important motivators. It is also essential to dispel their misconception regarding eye donation.

Conclusion

The present study revealed that medical students were well aware of eye donation (98.9%) with a favorable attitude towards it and most of them were inclined to pledge (80.9%) for eye donation. The majority had correct knowledge of time of collection of eye (70.7%) and 32.5% knew about the correct place of contact for eye

donation. The perceived reasons for not donating eyes need to be considered while creating awareness about eye donation in the community.

Medical students can be actively involved as volunteers in eye donation campaigns and after proper training in counselling techniques, they can act as counsellors for eye donation activities.

In undergraduate courses, more emphasis should be given to eye donation and eye banking so that they will play a pivotal role in the eye donation movement in our country; the Hospital Corneal Retrieval Program (HCRP) will be successful by active involvement of medical students.

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XALATAN® ABBREVIATED PACKAGE INSERT. TRADE NAME: Xalatan® 0.005% w/v eye drops solution. **PRESENTATION:** Each bottle contains 2.5mL eye drops solution; 100 ml eye drops solution contains 0.005g latanoprost. **INDICATIONS:** Reduction of elevated intraocular pressure in patients with open angle glaucoma, chronic angle closure glaucoma and ocular hypertension. Reduction of elevated intraocular pressure in paediatric patients with elevated intraocular pressure and paediatric glaucoma. **DOSAGE:** Instill 1 drop into the affected eye(s) once daily. Optimal effect is obtained when administered in the evening. Xalatan® eye drops may be used in paediatric patients at the same posology as in adults. **CONTRAINDICATIONS:** Known hypersensitivity to any component in Xalatan®. **WARNINGS & PRECAUTIONS:** May gradually change the eye color by increasing the amount of brown pigment in the iris. Patients should be monitored regularly and if the clinical situation warrants, Xalatan® treatment may be discontinued. Xalatan® should be used with caution in peri-operative period of cataract surgery patients, patients with a history of herpetic keratitis, aphakic patients, in pseudophakic patients with torn posterior lens capsule or anterior chamber lenses, or in patients with known risk factors for cystoid macular oedema, asthmatic patients. Experience to date shows that periorbital skin discolouration is not permanent. Latanoprost may gradually change eyelashes and vellus hair in the treated eye and surrounding areas. Xalatan® contains benzalkonium chloride. Contact lenses may absorb benzalkonium chloride and these should be removed before applying Xalatan® but may be reinserted after 15 minutes. Efficacy and safety data in the age group < 1 year are very limited. **INTERACTIONS:** There have been reports of paradoxical elevations in intraocular pressure following the concomitant ophthalmic administration of two prostaglandin analogues. **FERTILITY, PREGNANCY AND LACTATION:** Latanoprost has not been found to have any effect on male or female fertility in animal studies. The safety of this medicinal product for use in human pregnancy has not been established. Latanoprost and its metabolites may pass into breast milk and Xalatan® should therefore not be used in nursing women or breast feeding should be stopped. **SIDE EFFECTS:** Increased iris pigmentation; mild to moderate conjunctival hyperaemia eye irritation; eyelash and vellus hair changes; transient punctate epithelial erosions; blepharitis; eye pain; eyelid oedema: dry eye; keratitus; vision blurred; conjunctivitis; iritis/uveitis; macular oedema; symptomatic corneal oedema and erosions; periorbital oedema; misdirected eyelashes sometimes resulting in eye irritation; extra row of cilia at the aperture of the meibomian glands. **REFERENCE:** HK PI (version date/LPD date) Oct 2012 **DATE OF PREPARATION:** Sep 2014 **IDENTIFIER NUMBER:** XALT0914

XALACOM® ABBREVIATED PACKAGE INSERT. TRADE NAME: Xalacom® eye drops, solution 2.5mL, **PRESENTATION:** Each ml of Xalacom® contains 50mcg latanoprost and 5mg timolol. **INDICATIONS:** Reduction of intraocular pressure in patients with open angle glaucoma and ocular hypertension who are insufficiently responsive to topic beta-blockers or prostaglandin analogues. **DOSAGE:** Instill 1 drop into the affected eye(s) once daily. **CONTRAINDICATIONS:** Hypersensitivity to any component in Xalacom®. Reactive airway disease including bronchial asthma or a history of bronchial asthma, severe chronic obstructive pulmonary disease. Sinus bradycardia, 2nd and 3rd degree atrioventricular block, overt cardiac failure, cardiogenic shock. **WARNINGS & PRECAUTIONS:** History of severe cardiac disease. Respiratory reactions and cardiac reactions, including death due to bronchospasm in patients with asthma and rarely death in association with cardiac failures, have been reported following administration of timolol maleate. Caution in patients subject to spontaneous hypoglycemia or labile insulin-dependent diabetes. May mask signs of hyperthyroidism and worsen Prinzmetal angina, severe peripheral and central circulatory disorders and hypotension. Patients who are aphakic, pseudophakic with a torn posterior lens capsule or with known risk factors for macular oedema. May cause change in eye colour. Contact lenses should be removed before administration and maybe reinserted after 15 minutes **INTERACTIONS:** The use of two local beta-blockers or two local prostaglandins is not recommended. Epinephrine, oral calcium channel blockers, guanethidine or beta-blocking agents, antiarrhythmics, digitalis glycosides or parasympathomimetics, clonidine, antidiabetic agents **PREGNANCY AND LACTATION:** Should not be used during pregnancy since the potential risk for humans is unknown. Active substance and its metabolites may pass into breast milk and should not be used in women who are breast-feeding. **COMMON SIDE EFFECTS:** Increased iris pigmentation; Thickening and lengthening of eye lashes; Mild conjunctival hyperaemia; Transient punctuate epithelial erosions; Macular oedema, including cystoid macular oedema; Iritis/ uveitis; Corneal oedema and erosions; Eye irritation (including stinging, burning and itching) and eye pain. **REFERENCE:** HK PI (version date/LPD date) Jun 2009 **DATE OF PREPARATION:** July 2012 **IDENTIFIER NUMBER:** XALC0712

FULL PRESCRIBING INFORMATION IS AVAILABLE UPON REQUEST.

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