

EYE BANKING - NEED AND CHALLENGES

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Introduction

Corneal blindness in the developing world has a tremendous impact both on the quality of people's lives and related economic issues. Corneal blindness is at least 10 times more common in the developing world than in industrialised nations.¹ Many of the causes of corneal blindness are amenable to preventive health programmes and more rapid access to appropriate ophthalmic medical care. A recent study in Africa demonstrated that corneal transplantation has a greater impact in sighted years in the developing world than does cataract surgery.² Corneal transplantation is a surgical procedure available with good success rate, the major impediment being collection of donor eyes. This necessitates the setting up of an eye bank.

The purpose of this article is to provide an overview of the requirements for setting up an eye bank in order to provide safe, high quality tissue that can be utilized for sight restoration as well as to review the basic strategies that have been employed for increasing eye donation . The eye bank set up by the Aravind Eye Hospital is used as a model to explain the various steps involved. Further, it also attempts to look at the major challenges, which is impeding the implementation of a successful eye-banking Programme in the developing world.

Magnitude of the problem

The importance of corneal disease as a major cause of blindness in the world today remains second only to cataract, but its epidemiology is complicated and encompasses a wide variety of infectious and inflammatory eye diseases.³ Corneal infections with worse outcomes occur more often in children and elderly population, underprivileged areas with poor access to eye care services, and poor socio economic background.

The epidemiology of corneal blindness is diverse and is mostly dependent on the ocular diseases that are endemic in a particular geographical area. The diseases responsible for the increase in corneal blindness worldwide are trachoma, onchocerciasis, leprosy, ophthalmia neonatorum, and xerophthalmia. These diseases still remain important causes of blindness, but the recent success of public health programmes in controlling trachoma and onchocerciasis, has generated new interest in other causes of corneal blindness including ocular trauma, corneal ulceration and complications resulting from the use of traditional eye medicine.⁴

In India approximately 190,000 people are blind in both eyes and 590,000 persons are blind in one eye with corneal disorders according to the National Programme for Control of Blindness – World Health Organization Survey (1986 – 89). There is an inherent demand for nearly one

million eyes and an estimated 20,000 people are added to this backlog each year.⁵ These statistics however may not reflect the actual magnitude of the problem. A significant number of the corneal blind happens to be children. As emphasized by this statistics there is a great need for eye donation in India. Only a successful eye-banking program can facilitate this process.

Objective of setting up an eye bank

- Procure, process and distribute corneal tissue of the highest quality for transplantation
- Provide eye tissue for research and training
- Provide support and grief counseling to donor families
- Promote public relation activities

Rotary Aravind International Eye bank (RAIEB)

The Rotary Aravind International Eye Bank at Aravind Eye Hospital, Madurai was started in the year 1998 with the financial support from Rotary District 3000 and Rotary International 7620. The eye bank is affiliated to International Federation of Eye and Tissue Banks, and member of Eye Bank Association of India. Till the year 2001, the Eye Bank has collected over 3000 eyes and almost 50% of it was used for sight restoration.

Staffing

Medical Director	-	1
Administrator	-	1
Technicians	-	3

Atleast one technician should be trained formally in enucleation, corneal excision, serology procedures, aseptic techniques, preservation procedures and other eye banking activities by the International Federation of Eye and Tissue Banks, USA.

Equipment requirement

Slit Lamp	-	1
Laminar Air flow	-	2
Frost free refrigerator		
with temperature control	-	2
Specular microscopy	-	1 (optional)

Elisa Reader

Enucleation and Excision instruments

Styrofoam containers for packing and transportation

Temperature variations in the refrigerator must be recorded daily and remain within the range of 2 to 6 degree Celsius.

Requirement for setting up the eye bank

Space

The eye bank must have space dedicated solely for technical activities. There must be stable electrical source, adequate counter space for staff, storage of supplies, equipment, and laboratory facility. An International Eye Bank needs 1000 square feet with seven rooms. The following are the details:

- Tissue processing laboratory
- Serology room
- Instruments maintenance room
- Preparation room
- Reception
- Medical Director/Administrator's office
- Retiring room for technicians

Both the tissue processing and serology room should be maintained under strict aseptic techniques. Appropriate documentation of regular laboratory cleaning schedules must be maintained and kept.

Functions of an Eye Bank

1. Eye Donation – the procedure

- Eyes should be removed only by a registered medical practitioner trained in enucleation
- Retrieval of eyes (Enucleation or Excision) should be done within 4 – 6 hours of death
- Consent from the next of kin of the deceased is important before retrieval of eyes

Absolute contraindications for eye donation

- Death of unknown cause
- Septicaemia
- Jaundice
- Rabies & Tetanus
- AIDS
- Cancer in the eye

Consent

Under the existing law, removal of corneas must be done with the written consent of the donor family (next of kin) after the donor's death. Even in pledged donor, consent should be taken from close relatives.

2. Tissue harvesting

A person who is a Registered Medical Practitioner must perform enucleation.

3. Tissue evaluation

After enucleation, the eyeball shall be examined under a slit lamp for grading the cornea as Excellent, Very Good, Good, Fair and Not Suitable for Surgery. After the evaluation, removal of cornea from the enucleated eye shall be performed using sterile technique by individuals specially trained for it. Excised corneas can be preserved by short term & long term preservative medium.

Specular microscopy: After corneal excision, the cornea scleral rim is evaluated under a specular microscopy, which provides additional information about the suitability of the tissue for transplantation.

Serology testing: The required serologic tests as prescribed by the standards must be performed on each donor.

4. Promotion of public awareness

Restoration of sight to corneal blind patients through corneal transplantation depends entirely on the eye banks. Eye banks are the main source of tissue collection. In order to collect more number of tissues, the eye banks must have constant, consistent public education programmes to increase the awareness among the public.

Strategies for public education

Mass media

- Cable TV - One-minute message on eye donation, running messages, and phrases regarding eye donation to be flashed in local cable channels. However, it is important that these should be televised at regular intervals at prime time
- Cinema Slides: slides carrying the message of eye donation can be displayed in cinema halls.
- Articles highlighting the need for eye donation and corneal blindness to be published frequently in the local vernacular newspapers
- Radio – Short and catchy advertisements regarding eye donation at regular intervals

Public lectures

- Eye Bank staff and Ophthalmologist can give awareness lectures about eye donation with the help audio – visual aids to college students, social workers, voluntary organizations and to medical staff

Posters

- Posters and banners in local vernacular languages with effective message on “Eye Donation” may be displayed in prominent public places.

Pledging or registration

- Pledging for eye donation is an excellent strategy to create awareness. This can be done in any of the nearest eye banks. By pledging, the individual is aware of eye donation, the need for eye donation and other aspects concerned with it. As an individual has to get consent signature from the next of kin for pledging, the awareness further spreads to the family and friends.

Hospital Cornea Retrieval Programme

Concentrating on deaths that occur in hospitals will yield quality corneas and is the best strategy to increase awareness about eye donation. In this programme a trained grief counselor will be posted at the hospital to approach and motivate the family of the deceased for eye donation. Visually stimulating posters will be displayed at the concerned hospitals.

5. Networking

The success of an eye bank depends on the increased number of eye donations. Eye Banks cannot function in isolation. It has to integrate and work with other agencies and organizations such as the Lions clubs, rotary clubs, voluntary and non-governmental organizations, educational institutions, and more importantly health care institutes for achieving its objective.

Challenges

Inadequate public awareness

The most important and crucial challenge for an eye bank is to create awareness among the masses to convince and obtain consent for eye donation. A large number of people are not aware of eye donation and its benefits. Because of this, there is a major obstacle to convince and obtain consent from the family. On the contrary there are many myths that are disseminated rapidly about eye donation. Eye banks need to dispel the myths by addressing it properly. Success stories of corneal transplantation and interview with the donor family will, to a greater extent emotionally move the audience rather than a monotonous lecture about eye donation.

Lack of support by health care professionals

Hospitals are an excellent source for collecting quality corneas. Family physicians and health care professionals can have an influence on the family for eye donation. But only a minimum is collected from the hospitals. This is mainly because of the unwillingness and fear of the hospital authorities to ask for eye donation. Despite the social and legal approval for eye donation in the hospital, still there is fear among the health care professionals to make a request to the family of the deceased.

Improper legislative measures

In order to bridge the gap between the demand and supply of corneal tissues, proper legislative measures by the State and Central government needs to be initiated. To help increase the number of eye donation several laws have been passed in the United States, which definitely did have an impact, on it. The following are some of the legislative measures adopted

1. Uniform Anatomical Gift Act - provides a means for voluntary organ donation and for the next of kin to make a donation when the deceased had not indicated any objection to it.
2. Required Request Law – It requires hospitals to routinely make a request to the next of kin of the deceased
3. Presumed Consent – If the wish of the deceased is not known and the next of kin is not able to be contacted after a reasonable period of time (usually 12 hours) removal of corneal tissue is permitted on request from authorized personnel from the eye bank

Lack of financial support

For an eye bank to run successfully and to sustain financially, it needs adequate funds. As sale of donated eyes is prohibited legally and ethically, eye banks had to look for funds from Government or other social organizations. Government should support for the recurring expenditure of the eye banks.

Conclusion

Any successful eye-banking program in the developing world requires committed staff, appropriate infrastructure and financial support. Eye donation is a process. This process has to be adhered to, in a scientific manner with great commitment from the eye bank staff to obtain a positive result. Not only that, but a joint approach by medical professionals, government, voluntary organizations, social workers, and community in general reinforces the commitment and will strengthen the movement of eye donation and make it a reality.

Summary

Major interventions that can be adopted to increase the supply of corneas:

- Education to health professionals, voluntary organizations and social workers
- Creating awareness among the masses in general
- Hospital Cornea Retrieval Programme
- Strengthening of existing legislation

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Awareness in Patient

With the advent of technology, awareness amongst patient has increased to a great extent and they are now able to understand not only of their ailment, but also of the various diagnostic facilities that are available. Today a patient is no more afraid of a surgery, but instead is in a position to discuss with his surgeon of the best possible diagnostic tool available, even if that means to be a complicated surgery. This has hence hiked their expectation, which in turn plays a vital role in driving the healthcare providers, to give the best of services to their consumers. It does have a negative impact sometime, especially when a patient is preoccupied with partial knowledge of a diagnosis, he would not be in a position to accept any other explanation from a surgeon of the possible treatment in him. For example, a patient with partial knowledge of a Phaco surgery who tries to justify his standpoint with the surgeon with demands to adapt the technique to treat his cataract, not realizing the fact that his cataract is a complicated one. Such patient needs to be counseled to make them realize of the facts. In general Internet and other medias have played a vital role in bringing technology to the doorstep of the laymen. It has further approved of the necessity for updating the surgeon's knowledge and skills and above all has created a need for quality of service in healthcare providers.

