



REVIEW ARTICLE

EYE DONATION

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ABSTRACT

Eye is the peripheral organ of sight. Sight is a gift by God but unfortunately the blind people can't enjoy it. In India approximately 1% of the people are blind and the major causes of blindness include cataract, Glaucoma, refractive errors and corneal blindness. The causes other than corneal blindness are dealt satisfactorily. In case of corneal blindness, there are lacunas, keratoplasty is the only option for treatment. The only source of cornea is human donor's cornea. The demand of cornea in India is almost 1.5 lacks/annum. On the contrary number of cornea retrieval is about 35000 to 50000 per year. There are various misconceptions, lack of knowledge regarding eye donation and regional imbalances (in India) which needs to be minimized. Hence, to meet the increasing demand of corneas to provide vision to corneal blind, it is necessary to make eye donation popular. This is an attempt to highlight the points regarding eye donation and measures to be taken to accelerate the eye donation by various Government and non Government organizations. These programs should be widely implemented along with the help of religious organization and educational institutes, industry which can increase the awareness of eye donation. Also it needs to strengthen the eye banks, eye surgeons and trained man power for effective counseling, collection of eyeballs and its proper utilization. So every person should pledge to donate eyes and make eye donation popular.

Keywords: Eye donation, eye, cornea, keratoplasty, blindness

INTRODUCTION

Eye is a peripheral organ of sight. It works like a camera to perceive the image. Blindness is the condition which hampers the vision up to finger counting negative. There are various causes of blindness of which some are preventable and some curable. Cataract is the one having satisfactory surgical answers and its operatives are widely practiced all over the world.

In other causes of blindness, corneal blindness is one of the important factors, which is not having that many satisfactory answers. Corneal blindness needs keratoplasty, i.e. corneal graft. For that, need of cornea in India is consistently increasing and eye donation is the only way to get healthy cornea. But eye donation is not that much popular in India and there is a huge gap between need and supply of corneas. Only 30% of the donated eyes go to the needy.^[1] This is an attempt to highlight the issue and promote the eye donation in India to come up with the increasing demand of corneas.

According to census 2011, considering 122 crore Indian population, need of corneas is almost 150000 every year and number of eyes collected is approximately 35000 to 50000 eyes per year. To minimize this gap NPCB have taken various initiatives.

According to NPCB (National Program of Control of Blindness 1976) in 2012 target of 60000 eye collection was set and it was achieved up to 48014.^[2]

As a result of increasing awareness the collection of corneas is little bit increased. In 2013-14, target of 50000 collections was set and almost 57944 corneas were collected and in year 2014-15 target was same and almost 56994 corneas were collected. Still the figure of collections is too short to meet the need of corneas. So the eye donation movement must be accelerated to a greater extent.^[3]

There was a gross regional imbalance in implementation of this program. The south Indian states like Tamilnadu, Andhra Pradesh and Pondicherry, were the highest to achieve more than given target and in Northern States like Bihar, Himachal Pradesh and Jammu & Kashmir, were very poor performance in collection of eyes.^[4]

Definition

Eye donation is an act of donating one's eyes after his death^[5]. Only corneal blinds can be benefited through this process not other blinds. It is an act of charity purely for the benefit of the blinds and it is totally voluntarily done after death.

Current scenario

In India considering current population as per the census 2011, 1% blindness constitutes approximately 1.22 crores. As per the survey, out of which the corneal blinds are estimated to be 1.22 lakh which are bilaterally corneal blind. As per the survey conducted in year 2006-07 prevalence of blindness in India has decreased from 1.1% to 1%. But still there are many issues and corneal blindness is one of

them.^[5] Out of which approximately only 60000 can be given vision by keratoplasty. Only 50% of the collected eyes can be utilized for the purpose of optical keratoplasty. In addition to above 20000 new cases of corneal blinds are being added annually.

Considering the need of corneas, India needs approximately 1.5 lakh corneas per year as on today.

More than 90% corneal transplants are carried out successfully. Corneal transplant in infants born with cloudy cornea makes a big difference in their lives. Cornea adopted or donated is used for transplantation, research and education. Eyes which cannot be used for transplant are used for research and education.^[3]

WHO CAN DONATE THE EYE

1. Anyone from age of 1 to no age limits. What we need is to make a will to donate eyes. A blind person with a clear cornea can also donate eyes. It is a noble deed. It requires support of friends, relatives and society.
2. People using spectacles, DM or hypertension can also donate eyes. Relatives of the deceased can decide to donate the eyes of their beloved ones.
3. Eyes have to be removed within 6 hours after death. So it is important to get in touch with your nearest eye bank at the earliest and let all the relatives be aware of your will to donate your eyes.

Things to do-

1. Keep the eyes of deceased closed and covered with moist cotton or cloth.
2. Switch off the ceiling fan to avoid dryness.
3. If possible put antibiotic eye drops in eyes of deceased to resist microbes.
4. Raise the head of deceased by 6 inches to reduce chance of bleeding at the time of removal of eyes.

Who can't donate-

1. Death due to unknown causes.
2. People who die due to infection like rabies, syphilis infections, viral hepatitis, septicemia and AIDS (HIV positive cannot donate).
3. Leukemia and disseminated lymphoma.
4. Intrinsic eye disease like malignancy.^[6]

Causes of cornea opacification-

1. Infection, injuries, iatrogenic (mal practiced eye surgery, etc).
2. Malnutrition, congenital or hereditary.

Cornea transplant-

It is an operation in which abnormal corneal host tissue is replaced by healthy donor cornea. A corneal graft may be full thickness (penetrating) or partial thickness (lamellar).^[6]

Conflict-

There are no religious conflicts. Eye donation gives gift of sight to the needy blinds. Eye donation does not cause any disfigurement of the deceased and doesn't hamper the funeral arrangement. It is believed the whole of the eye is transplanted but it is untrue, only the cornea is transplanted. Till now living persons' eyes

are not accepted and recipient is not informed about the donors' details.

Do's regarding eye donation^[7]

1. Eyes may be donated only after death.
2. Eyes must be removed within 4-6 hours after death.
3. Nearest eye bank must be informed immediately.
4. Eye must be removed by trained doctors at home or at hospital.
5. Removal of eyes takes 10-15 minutes and does not lead to any disfigurement of eye.
6. Only the transparent section of eye called as cornea is taken out and not the full eyeball.
7. A small quantity of blood will be drawn to rule out the communicable diseases.
8. Anyone can pledge as preferably to nearest eye bank.
9. Identities of both donor and recipient remain confidential.
10. One pair of eyes gives vision to two corneal blind people.
11. Eye donated to eye bank that are not suitable for transplant are used for medical education and researches.
12. Storage- 2-8 degree Celsius- common method of storage allows for 7-14 days. This is known as short term storage.

NPCB Future Action Plan.

1. Proper training of eye surgeons, counselors and eye bank personals.
2. Integration of eye banks all over the country for maximal utilization of donor tissue,

to avoid multiple registrations and to achieve distribution justice.

3. NPCB celebrates eye donation fortnight 25th August to 8th September every year.
4. MTNL (Mahanagar Telephone Nigam Limited) 1919 toll free number in metro cities in regards to eye donation.
5. Hospital retrieval program must be made mandatory to hospital while issuing death certificate.

According to recent quotation by Prime Minister of India, there is accidental death after every 4 minutes. In such situations organ retrieval must be mandatory with consent of relatives. Help of religious organization and leading educational institute can be taken to increase awareness about eye donation.

Eye bank^[7]

1. An eye bank is a nonprofit community organization managed by medical director, eye bank manager and eye bank technicians.
2. It collects, evaluates, stores and distributes eyes donated by donors.
3. Entire eye is enucleated or only cornea may be in situ.
4. Donated eyes are evaluated using strict medical standards.

Functions of eye bank

1. Availability of trained staff round the clock to attend the calls.
2. Evaluate and provide quality corneas to corneal surgeons.
3. Enable corneal research using eyes unsuitable for grafts to find newer techniques,

improve preservation methods and train corneal surgeons.

4. Increase public awareness about eye donation and eye banking and what happens after eye donation.

Eye bank retrieves and stores eyes for corneal transplants and research (in U.S currently 46,000 transplants each year for the Rx of keratoconus and corneal opacities. Match typing is not necessary for transplantation.

Storage

Methods of preservation of cornea

1. Short term storage (46 hrs)

The whole globe is preserved at 2-4 degree Celsius in the moist chamber.

2. Intermediate storage up to two weeks- donor cornea can be stored in McCareykaufman (M K Eusol) medium like optisol solution.

3. Long term storage up to 35 days by organ culture method^[8]

Storage of cornea at extreme low temperature may results into coagulation of protein and corneal opacification.

Laws of various countries regarding Eye Donation:

1. U.K. – In U.K. organ donation is voluntary and no consent is presumed. Individuals who wish to donate organs after death can use the organ donation register a national database.^[12]

2. Europe- Within the European union organ donation is regulated by member states as of 2010, 24 European countries are the members of European Union..^[10]

3. Japan- Rate of organ donation in Japan is significantly lower than western countries due to cultural reasons, distrust of western medicine and a controversial organ transplantation in 1968 which provoked ban on organ donation but organ donation in Japan is regulated by 1997 Act. Organ transplant law, which defines brain death and legalized organ procurement from brain dead donors.^[9]

4. Israel- Since 2008 signing an organ donor card in Israel has provided a potential medical benefit to signer the policy- Don't give, Don't get, increased organ donations after 2008.^[10]

5. New Zealand- Live organ donation is less in New Zealand because it is illegal to pay someone for their organ. Human Tissue Act 2008, in which trading human tissue is prohibited and is punishable. But it allows organ donation after death. Everyone who applies for driving license is asked for his will to donate organs. Individuals must answer yes or no in organ donation have yield increase in organ donation.^[11]

6. Sri Lanka- Sri Lanka Eye Donation society- Sri Lanka, a country with 20 million population is the largest provider of cornea in the world. The cultural background of the country that is the Buddhist concept of "Dana" or giving has been the route cause of increased

Eye Donation in Sri Lanka. The government of Sri Lanka and the Sri Lanka Eye Donation society an NGO have played an important role in Eye Donation.^[12]

Sri Lanka Eye Donation society is an NGO involved in donating eyes and tissue for transplant. It serves for patents in need both in Sri Lanka and around the world without profit provides corneas free of charge. The society was formed in 1961 by Deshbandhu Dr. Hudson Silva, since then organization has provided almost 60000 corneas for transplant, for patients in 57 countries and almost 9 lakh people have signed up to donate their eye to the society after their death.

The society receives about 3000 corneas a year and more than 2000 are shipped abroad. In Sri Lanka itself citizens have first access to free corneas.

The human tissue transplantation act number 48 of 1987 set out the legal framework for tissue procurement and transplantation in Sri Lanka.^[13]

Since then Sri Lanka Eye Donation society maintains the national eye and tissue bank which is one of the largest in the world established in the 1980s.

7. Australia - Depending on the State in Australia, either consent or an absence of objection is required for donation to proceed. This can be indicated by the donor prior to their death, and confirmed by the next of kin after the donor's death, or more commonly, the next of kin providing consent as long as the

donor did not object to donation in their life time.^[14]

8. India has a fairly well developed corneal Eye Donation program. However donation after brain death has been relatively slow. Eye Donation is possible in only deceased. It must be made possible in brain dead also to accelerate the rate of Eye Donation. The transplantation of human organs act in 1994 brought out significant change in organ donation and transplantation scene in India. The same law must be made mandatory in case of Eye Donation.^[15]

Measures to improve Eye Donation

1. Effective enforcement of the law of Eye Donation.
2. Wide education and publicity about Eye Donation.
3. Help of educational institution for promotion of Eye Donation can be taken and Eye Donation topic should be included in school syllabus uniformly.
4. Help **of industry** can be taken to accelerate Eye Donation movement.
5. Help of religious organizations also can be taken to accelerate Eye Donation movement by minimizing the religious conflicts in various religions.
6. Removal of the fear of organ trade business.
7. To promote the Eye Donation of brain dead person.
8. Law must be amended to make Eye Donation possible in a brain dead person also.

9. At the time of various registrations by government Authority eg. Driving license, Aadhar etc a form of having choice yes or no for Eye Donation should be filled.

10. In case of accidental deaths, at the time of postmortem retrieval of eyes must be done wherever possible with information to relatives.

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