

Potential for Hospital Based Corneal Retrieval in Hassan District Hospital

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ABSTRACT

Context: In developing countries, corneal diseases are the second leading cause of blindness. This corneal blindness can be treated through corneal transplantation. Though the present infrastructure is strong enough to increase keratoplasty numbers at a required rate, India has largest corneal blind population in the world. So a constant supply of high quality donor corneal tissue is the key factor for reduction of prevalence of corneal blindness. Considering the magnitude of corneal blindness and shortage of donor cornea, there is a huge gap in the demand and supply.

Aim: To study the potential for hospital based retrieval of donor corneal tissue in Hassan district hospital after analysing the indicated and contraindicated causes of deaths, so that hospital corneal retrieval program in Hassan district hospital can be planned.

Materials and Methods: The cross-sectional, retrospective and record-based study included all hospital deaths with age group more than two years occurred during one year period (January

2014 to December 2014). Data regarding demographic profile, cause of death, treatment given and presence of any systemic diseases were collected. The causes of deaths which are contraindicated for the retrieval of corneas were analysed and noted. The contraindications were based on the NPCB guidelines for standard of eye banking in India 2009.

Results: Out of 855 deaths, number of deaths in males (565) was greater than females (290). Numbers of deaths were highest between 41-60 years age group (343). Deaths due to HIV, septicaemia, meningitis, encephalitis, disseminated malignancies were contraindicated for corneal retrieval. Corneas could be retrieved from 736 deaths out of 855. Potential for corneal retrieval in a period of one year in Hassan District hospital was 86%.

Conclusion: Hospital corneal retrieval program has got a great potential to bridge the gap between the need for the cornea and actually collected corneas which will contribute enormously in eliminating corneal blindness. In present study there was 86% potential for corneal retrieval among the hospital deaths.

Keywords: Corneal blindness, Donor contraindications, Eye Donation, HCRP

INTRODUCTION

In developing countries, corneal diseases are the second leading cause of blindness. This corneal blindness can be treated through corneal transplantation. Though the present infrastructure is strong enough to increase keratoplasty numbers at a required rate, India has largest corneal blind population in the world. So, a constant supply of high quality donor corneal tissue is the key factor for reduction of prevalence of corneal blindness. At present there is a huge gap in the demand and supply. Development of professional eye bank managers and the establishment of Hospital Cornea Retrieval Programs are the important factors which can help in reducing the corneal blindness [1].

Considering the magnitude of corneal blindness and shortage of donor material, we conducted this hospital based study on potential for corneal retrieval in district hospital, so that we can plan for hospital corneal retrieval program in Hassan district hospital.

MATERIALS AND METHODS

This is a cross-sectional, retrospective and record-based study, conducted at Sri Chamarajendra district hospital, HIMS, Hassan, Karnataka, India. Ethical clearance has been obtained from Institutional Ethical Committee of HIMS, Hassan. After obtaining necessary permission from the concerned authorities, The case records were obtained from the medical record department. Data was collected for the duration of one year that is from January 2014 to December 2014. All hospital deaths with age of more than two years were included and less than two years were excluded from the study.

Data regarding demographic profile, cause of death, treatment given and presence of any systemic diseases were collected. The cause

of deaths which are contraindicated for the retrieval of corneas were analysed and noted. The contraindications were based on the NPCB guidelines for standard of eye banking in India 2012 [2] [Table/Fig-1].

Based on these details of the cause of deaths, deceased from whom cornea could have been collected and who were not fit for corneal retrieval were recognised.

STATISTICAL ANALYSIS

The statistical method used is percentage.

RESULTS

In the duration of one year we noted a total of 855 deaths. The demographic profile is shown in [Table/Fig-2,3]. The number of various causes of deaths was as in [Table/Fig-4].

Among the 138 poisoning causes 108 were of organophosphorous compound poisoning, rest 30 were of colchicines, paraquet, rat and unknown poisoning causes. None were of cyanide poisoning. Head injury was the cause of death among 70 deaths. Most of the deceased due to poisoning and head injury were young, thereby more possibility for better quality corneas.

The cause of deaths excluded for considering corneal retrieval were 34 HIV seropositive deaths, 74 deaths due to septicemia, meningitis and encephalitis and 11 malignancy deaths. Malignancies were excluded, as the metastasis status could not be ascertained. So, 119 deaths out of the 855 deaths were contraindicated for donor corneal retrieval. Cornea can be retrieved from 736 deaths out of 855. Therefore, potential for corneal retrieval in a period of one year in Hassan District hospital is among 86% of deaths.

(I) Conditions with potential risk of transmission of local or systemic communicable from donor to recipient.
a. Death of unknown cause.
b. Death with neurologic disease of unestablished diagnosis.
c. Subacute sclerosing panencephalitis.
d. Progressive multifocal leukoencephalopathy.
e. Active meningitis or encephalitis.
f. Encephalopathy of unknown origin or progressive encephalopathy.
g. Active septicemia (bacteremia, fungemia, viremia, parasitemia).
h. Active viral hepatitis.
i. Creutzfeldt-Jakob disease.
j. Congenital rubella.
k. Reye's Syndrome.
l. Rabies.
m. Active miliary tuberculosis or tubercular meningitis.
n. Patients on ventilator for > 72 hrs.
o. Hepatitis B surface antigen positive donors.
p. HTLV-I or HTLV-II infection.
q. Hepatitis C Seropositive donors.
r. HIV seropositive donors.
s. Active ocular or intraocular inflammation- conjunctivitis, scleritis, iritis, uveitis, vitritis choroiditis andretinitis (at the time of death).
(II) Conditions with potential risk of transmission of non-communicable disease from donor to recipient.
a. Death due to cyanide poisoning.
b. Intrinsic eye disease.
c. Retinoblastoma.
d. Malignant tumours of the anterior ocular segment or known adenocarcinoma in the eye of primary or metastatic origin.
e. Leukemias.
f. Active disseminated lymphomas.

[Table/Fig-1]: Contraindications for donor corneal retrieval [2]

DISCUSSION

Oliva MS et al., stated that in Southern India, the prevalence of corneal blindness has been predicted to grow from 0.66% (2001) to 0.84% (2020) [1]. As per the 2012 Indian National program of control of blindness news letter, only 50% of the eyes collected, can be utilized for optical keratoplasty and 20,000 fresh corneal blindness cases are being added yearly and 0.12 million implantable corneas are needed. But eyes being collected are only about 45,000 to 50,000 inspite of there being a progress in Eye Donation and increase in number of Eye banks. Thereby India has a deficiency of 1.40 lac corneas [3].

In Karnataka the number of corneas collected (3,251) when compared to target (5,500) is disappointingly low when compared with other South Indian states like Andhra Pradesh, Tamil Nadu, Maharashtra and Pondicherry, mainly due to lack of public awareness and poor communication between the donor and the transplant team.

Van Meter WS et al., concluded that death-to-preservation (DP) time longer than 6 hours results in sloughing of the donor epithelium and care of donor epithelium prior to harvesting is important if death-to-preservation time is longer than 6 hours. Donor corneas with lower death- to-preservation time are useful in penetrating keratoplasty [4]. Hence cornea should be taken from the deceased person within 6 hours.

Considering the magnitude of corneal blindness and shortage of donor material, more marked in our state, this study about Potential for Corneal Retrieval was conducted in district government hospital, Hassan District in Karnataka, India.

Corneas can be retrieved from deceased in a hospital or at the place where death has occurred.

	Number of deaths	Percentage of deaths
Males	565	66%
Females	290	34%
Total	855	100%

[Table/Fig-2]: Number of deaths in Male and Female population. Number of deaths in males (565) is greater than females (290).

Age Distribution (in years)	Number of deaths	Percentage of deaths
<10	5	0.58%
10-20	35	4.09%
21-40	220	25.73%
41-60	343	40.11%
61 & Above	252	29.47%
Total	855	100%

[Table/Fig-3]: Number of deaths in different age groups. Number of deaths highest between 41-60 years age group (343).

Causes	Number of Deaths
Poisoning	138
Snake Bite	8
Respiratory	140
Cardiovascular	165
Head Injury	70
CVA, Hepatic Encephelopathy, Epilepsy	136
Renal	16
Metabolic	25
HIV Seropositive	34
Septicemia, Meningitis, Encephelitis	74
Malignancy	11
Hypovolemic Shock	24
Alcoholic Intoxication	14

[Table/Fig-4]: Number of deaths due to various causes

Chopra GK et al., described a system of corneal donor retrieval in a major teaching hospital and their results showed an overall procurement rate of about 30% and also concluded that a rapid corneal retrieval can be achieved by efficient notification and on-call retrieval system, thereby decreasing the death to storage medium time to two hours or less [5].

The study by Tandon R et al., showed 159 potential donors from 721 Postmortem cases, who had not pledged their eyes for eye donation previously and so concluded that the prior knowledge of eye donation had no influence on willingness for eye donation [6].

Sangwan VS et al., concluded that inspite of increasing eye donation and corneal retrieval, still it is not possible to procure 200,000 tissues annually to do 100,000 corneal transplants a year. They also suggested three tier eye banking system since there exists a tremendous gap in demand and supply of corneal tissue [7].

Hospital Cornea Retrieval Programme (HCRP) focuses on hospitals to retrieve corneal tissue because of several inherent advantages like availability of medical history, availability of tissues from younger individuals, reduction in time interval between death and corneal excision [8], availability of well-versed staff round the clock, trained Eye Donation Counsellors/Social workers can contact eye donor family for better counselling and motivation and also collect donor medical information. All the above studies suggests that hospital corneal retrieval is more effective with less effort, prior knowledge of eye donation is also not a prerequisite as the hospital staff can educate the relatives of the deceased.

NPCB has stressed upon to keep a tag on the hospitals where mortality rate is high (at least 4 to 5 deaths per day). In this hospital where we have conducted our study mortality rate is 2 to 3 per day so the potential for corneal retrieval is high.

According to our study, we can retrieve cornea in 86% of deaths i.e. from 736 out of 855 deceased persons which is a huge number and will contribute enormously in treating corneal blindness.

LIMITATIONS

Limitations of this study was, being a retrospective study, we couldn't collect data regarding willingness of the relatives for deceased eye donation and also regarding the status of cornea of the deceased at the time of death.

CONCLUSION

Hospital corneal retrieval program has got a great potential to bridge the gap between the need for the cornea and actually collected corneas, which will contribute enormously in eliminating corneal blindness. In our study there was 86% potential for corneal retrieval among the hospital deaths.

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