Potential for hospital cornea retrieval programme in a rural medical college

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Abstract

Background: Corneal diseases are an important cause of blindness in our country. Visual rehabilitation of the corneal blind is possible by transplantation (Keratoplasty) of cornea retrieved from voluntary eye donation. Voluntary eye donations are unable to meet the demand for donor corneas. Hospital Cornea Retrieval Programme has the potential in increasing the number of donor corneas.

Aim: To study the potential for hospital cornea retrieval programme in adichunchanagiri Institute of Medical Sciences, B.G. Nagara.

Materials and Methods: This retrospective, record-based study included all hospital deaths of our institution that occurred over a one year period between October 2014-September 2015. Data regarding the demographic profile, cause of death, systemic diseases and treatment given were collected from the medical records. The number of patients from whom corneal retrieval could have been done was analyzed after excluding those patients in whom corneal retrieval was contraindicated as per national programme for control of blindness guidelines.

Results: a total of 290 deaths had occurred during the study period. The highest number of deaths were in the age group of 61-70 years. Cardiovascular causes stood out as the most common cause of death. Corneas could have been retrieved in 173 patients (n=290). Thus the potential for hospital cornea retrieval programme in our institution was in 59.66% of the deaths.

Conclusion: There is a good potential for hospital cornea retrieval programme in our institution. Hospital cornea retrieval programme can help in reducing the burden of corneal blindness in our country if implemented in a co-ordinated manner.

Keywords: Blindness, Cornea retrieval, Eye donation, Keratoplasty

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Introduction

The prevalence of blindness in India has been estimated to be around 12.5 million[1,2] which amounts to 1% of the total population. There are approximately 6.8 million people in our country with a visual acuity of less than 6/60 in atleast one eye due to corneal diseases and among these about 1 million have bilateral corneal blindness.[3,4]

The common causes of corneal blindness in our country include trauma, infectious keratitis (caused by bacteria, fungi, viruses) and vitamin A deficiency (Fig. 1). A corneal transplant procedure (Keratoplasty) is the best option for the visual rehabilitation among such patients (Fig. 2). The two options for procuring corneas for keratoplasty are voluntary eye donations by well informed and motivated public and Hospital Cornea Retrieval Programme (HCRP).

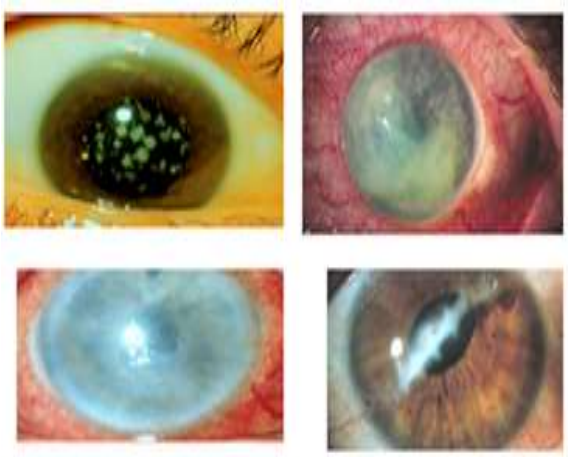

Fig. 1. Causes of corneal blindness (clockwise from top) 1. Corneal dystrophy 2. Corneal ulcer with impending perforation 3. Pseudophakic bullous keratopathy 4. Traumatic corneal laceration causing corneal opacity

HCRP was initiated by the Ramayamma International eye bank in 1990. The objective was to concentrate on the potential eye donations from hospital deaths by utilizing a combined method of motivation and grief counseling.[5]

We undertook this study to know the potential for HCRP in our institution over a one year period.

Fig. 2: Showing an eye after corneal transplantation

Materials and Methods

Our study is a retrospective, record-based study conducted at Adichunchanagiri Institute of Medical Sciences, B.G. Nagara. Ethical clearance for the study was obtained from the Institutional Ethical Committee. Permission for the retrieval of medical records was obtained from the concerned institutional authorities.

We collected the data of all the deaths that occurred in our hospital over a one year period between October 2014- September 2015. The demographic profile, systemic illnesses, treatment given and cause of death was noted down from the medical records for each patient.

Those patients who had contraindications for corneal retrieval/ transplantation of retrieved corneas as per the NPCB guidelines for standard of eye banking in India 2012[6] as shown in Table 1. were excluded as potential corneal donors. Based on the above, those patients from whom corneas could have been collected were analyzed.

Table 1: Contraindications for corneal retrieval/ transplantation of the retrieved corneas[6]

Contraindications for corneal retrieval	1. Acute viral hepatitis 2. Acquired Immunodeficiency syndrome of HIV 3. Acute viral encephalitis or encephalitis of unknown origin 4. Creutzfeldt-Jacob disease 5. Rabies
Absolute Contraindications for transplantation of the retrieved corneas	1. Death of an unknown cause 2. Death with neurological disease of unestablished diagnosis 3. Active meningitis or encephalitis 4. Encephalopathy of unknown origin or progressive encephalopathy 5. Active septicemia 6. Active hepatitis 7. Creutzfeldt-Jacob disease 8. Rabies 9. Active military tuberculosis or tubercular meningitis 10. Hepatitis B surface antigen positive donors 11. HTLV-I or HTLV-II infection 12. Hepatitis C seropositive donors 13. HIV seropositive donors

Results

During the one year study period, 290 deaths had occurred. The age and gender distribution of the cases are as shown in Table 2.

Table 2: Age and gender distribution of the patients

Age distribution (in years)	**Number of patients**	**Percentage**
<2	14	4.83
2-10	3	1.03
11-20	9	3.10
21-30	22	7.59
31-40	21	7.24
41-50	45	15.52
51-60	60	20.69
61-70	75	25.86
>70	41	14.14
Total	290	100
Gender distribution	**Number of patients**	**Percentage**
Males	190	65.52
Females	100	34.48
Total	290	100

The highest number of deaths occurred in the 61-70 years age group (75 patients; 25.86%). The number of deaths was greater among males (190 patients; 65.52%) than females (100 patients; 34.48%).

Cause of death: The distribution of patients based on the cause of death is shown in Table 3.

Table 3: The distribution of patients based on the cause of death

Cause of death	Number of cases	percentage
Cardiovascular diseases	80	27.59
Cardiorespiratory causes	50	17.24
Septic shock	19	6.55
Meningitis/meningoencephalitis	4	1.38
Renal causes	9	3.10
Respiratory diseases	15	5.17
Poison consumption	16	5.52
Snake bite	4	1.38
Cerebrovascular accidents	16	5.52
Carcinoma	6	2.07
Hepatic diseases	8	2.76
Burns	5	1.72
Seizure disorders	2	0.68
Dengue complications	3	1.03
Acute gastroenteritis-hypovolemia	4	1.38
HIV	1	0.34
Metabolic encephalopathy	5	1.72
Unknown causes	30	10.34
Head injury	13	4.48
Total	290	100

Cardiovascular causes like myocardial infarction and cardiac arrest were the most common cause of death in our institution (80 patients; 27.58%) followed by respiratory diseases (50 patients; 17.24%).

Among the 290 deaths, 117 patients (40.34%) were excluded as shown in Table 4. based on the guidelines of NPCB.[6]

Table 4: Showing causes of exclusion of patients based on NPCB guidelines[6]

Causes of exclusion	Number of patients
Age < 2 years	14
Age > 70 years	41
Meningitis/ meningoencephalitis	4
Septicemia	19
Death due to unknown cause	30
Carcinoma	6
HIV	1
Viral hepatitis	1
Pulmonary tuberculosis	1
Total	117

Corneas could have been retrieved in 173 patients (59.66% of the deaths). Thus, in our hospital, there is a potential for retrieval of donor corneas in atleast 60% of the deaths.

Discussion

It has been estimated that bilateral corneal blindness constitutes 1% of the total blindness in our country. By 2020, the number of patients with unilateral corneal blindness in India is estimated to rise to 10.6 million.[4] Every year 20000 new cases of corneal blindness are being added to the existing burden in our country.[7]

Of the corneal tissue retrieved, only 50% can be utilized for keratoplasty.[7] Taking into account the existing burden of corneal blindness and the addition of new cases of corneal blindness, the target set by NPCB for corneal retrieval for 2011-12 was 6,00,000 and only 48,014 corneas (8%) were retrieved. For the state of Karnataka, the target given for the same period was 5,600 and the number of corneas actually retrieved was 3,251 (58.1%).[7]

The reasons for the low availability of the donated corneas may be attributed to social causes (cultural barriers, superstitious beliefs etc.), lack of local eye banks and lack of awareness among the population about the importance of eye donation.

In HCRP, trained eye donation counsellors approach the family members of the deceased and provide grief counseling and encourage them to consider eye donation. This makes the programme more effective since even those who do not have a prior knowledge of eye donation can be educated and motivated by the eye donation counselors who will be available round the clock in the hospital.

The HCRP which focuses on hospitals to retrieve corneal tissue has several advantages[5] like:

i) Availability of a detailed and reliable medical history in the hospital records.
ii) Availability of corneal tissue from younger individuals.
iii) Reduction in the time interval between the death of the donor and corneal retrieval.
iv) Cost effectiveness.

According to our study, corneas could have been retrieved from 173 out of the 290 deaths over a one year period amounting to 59.66%. This is a significant number and can contribute to the reduction of corneal blindness in our state.

Conclusion

HCRP can play an important role in the reduction of the burden of corneal blindness in India if implemented in a co-ordination with the local eye banks and tertiary eye care hospitals. It can help us to retrieve more number of corneas annually which can help us meet the ever increasing demand for donor corneas.

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