

## **Comparison of quantity and quality of donor tissue by voluntary eye donation (VED) versus Hospital Cornea Retrieval Program (HCRP)**

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**Purpose :** Corneal blindness is a major problem in the community. The success of corneal transplantation depends upon a constant supply of good quality donor tissue. The aim of the present study was to compare data in terms of collection and utilization between Voluntary Eye Donation (VED) and Hospital Cornea Retrieval Program (HCRP).

**Methods and Materials:** Retrospective study (September 2004 to June 2009). All donor tissues were grouped depending upon mode of collection into VED and HCRP. Relevant data about donor patient including age, cause of death, etc. recorded and blood for serology screening obtained by trained personnel. All excised donor tissues preserved in McCarey-Kaufman medium till utilization. Pre-operatively all donor tissues evaluated on slit lamp by cornea specialists and subjected to specular microscopy. Unsuitable donor tissues used for educational and research purposes.

**Results:** Total collection of donor tissues in this period was 2444. Total collection and utilization by VED was 746 and 318 respectively (42.63% utilization rate) and by HCRP was 1698 and 921 respectively (54.24% utilization rate).

**Conclusion:** HCRP is a better and much more effective system of corneal donor tissue retrieval in terms of both collection and utilization. However community participation through VED and pledged donations must continue.

### **Aims and Objectives**

Corneal blindness is a major problem in the community. The success of corneal transplantation depends upon a constant supply of good quality donor tissue. The aim of the present study was to compare data in terms of collection and utilization between Voluntary Eye Donation (VED) and Hospital Cornea Retrieval Program (HCRP).

### **Design**

Retrospective study.

### **Study Duration:**

Data was analyzed in the period September 2004 to June 2009.

### **Materials and Methods**

All donor tissues were grouped depending upon mode of collection into VED and HCRP. All donor tissues in the VED group were collected when information was provided to the Prova Eye Bank affiliated to Disha Eye Hospitals and Research Centre Private Limited, Barrackpore, West Bengal, India. All donor tissues in the HCRP group were collected from RG Kar Medical College. All donor tissues in the VED group were excised by the whole globe technique. Sclero-corneal buttons were excised in all donor tissues in the HCRP group. Relevant data about donor patient including age, cause of death, etc. recorded and blood for serology screening obtained by trained personnel. All excised donor tissues were preserved in McCarey-

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Kaufman medium until utilization. Pre-operatively all donor tissues evaluated on slit lamp by cornea specialists and subjected to specular microscopy. Unsuitable donor tissues used for educational and research purposes. This retrospective study was conducted in accordance with the principles in the Declaration of Helsinki. It was approved by institutional ethics committee- Institutional Review Board.

### Results

The total collection of donor tissues in this period was 2444 and total utilization of donor tissue was 1239. The total collection and utilization by VED was 746 and 318 respectively with 42.63% utilization rate. In the VED group the total number of Therapeutic Penetrating Keratoplasty (TPK) was 185 and the total number of Optical Penetrating Keratoplasty (OPK) was 127. The total collection and utilization by HCRP was 1698 and 921 respectively with 54.24% utilization rate. The total number of Therapeutic Penetrating Keratoplasty (TPK) was 168 and total number of Optical Penetrating Keratoplasty (OPK) was 653 in the HCRP group. Out of the 318 donor tissues utilized in the VED group 127 were used for OPK (39.93%) and OPK utilization rate in HCRP group was 70.90%.

### Discussion

The total number of corneal blindness in the world is approximately 8 million. The total number of corneal blindness in India is approximately 2 million with 0.5 million with bilateral affection. Around 50,000 patients are added to the list every year. We need around 1 lakh keratoplasties in a year to meet the demands of the community which translates into around 2 lakh donor corneas.

The sources of eye donation are from Voluntary Eye Donation (VED) and Hospital Cornea Retrieval Program (HCRP). VED is possible through prior pledge donation or

without prior pledge donation. The number of pledge donations brought about by various public awareness campaigns are usually voluminous but number of donor corneas retrieved in VED do not match up to the numbers. In fact majority of VED is without prior pledge donation and the total number donor corneas through VED cannot meet the demands. The utilization rate of donor corneas through VED is also reduced due to poor quality control (Whole globe v/s corneoscleral button). The inspection of the cadaver, drawing of blood, availability of death records, etc which are necessary for successful eye banking program are hampered due to social and religious aspects in India. The need for HCRP, a newer approach to eye banking thus arose.

The primary pivotal role is of the Grief Counselor or Eye Donation Counselor (EDC) who actively motivates the family member of the deceased. There is at least one EDC in the hospital round the clock who is informed in case of death. The EDC promptly informs his team and after thorough documentation including patient details, cause of death, significant past history, hospital records, etc the team retrieves the corneoscleral button and transfers it to the Mc-Karey Kaufman medium. The drawing of blood for serological testing also is easier in a hospital setting. The EDC and his team also provide moral and logistical support to the family members of the deceased in completing the complexities in that situation. The conversion rate is between 5 - 20 % (Table 1) and gradually in due course of time the support staff of the hospital is involved. The overall advantages of HCRP are appropriate death certificate in time, Death-Enucleation time is minimal, medical records are easily accessible, history from treating physician can be obtained, past history from relatives, blood sample collection is easier, younger donor tissues, better quality control of tissues and the ideal awareness program for eye donation.

	2004	2005	2006	2007	2008	2009	Total
Counseled Families	184	546	1014	1123	1026	926	3889
Retrieved after motivation	11	82	205	248	216	176	849
<b>Conversion Rate</b>	7.6%	15 %	20.2%	22.1%	21.1%	19%	18.6%

Table 1 showing number of counseled families of the deceased and number of retrieved corneas after motivation with conversion rate from 2004 to 2009

Disha Eye Hospitals and Research Centre (Advanced Tertiary Eye Care Centre) in collaboration with R.G Kar Medical College Hospital (Tertiary Multispeciality Hospital) started HCRP in 2004. The distance between the two centres is 18 Km. The Medical college hospital has more than 800 beds with separate cardiac and other superspeciality units with ICCU and emergency facilities. The average death rate is 4.7/day (90-150/month). The advanced eye care centre has up to date Eye banking facilities meeting international standards.

Since 2004, there has been a steady increase in motivational counseling of families of the deceased which has translated into more number of donation with improving conversion rates. The efficiency with regards to this has lead to growing collection rates (Fig 1). The introduction of HCRP since 2004 has improved collection (Table 2) and thereby greater quantity of donor tissues available for utilization. This growth has thereby helped both the collection and utilization of donor tissues (Table 3). This has helped in significant improvement in the utilization rates in the HCRP group with VED group collection and utilization becoming stagnant (Fig 2). The utilization rate in the HCRP group is better than that in the VED thus showing better quality of donor tissues (Table 4). The number of optical penetrating keratoplasties (OPK) using donor corneas from the HCRP group far

exceeds that from the VED group. This means that after screening of donor corneas by cornea specialists and after evaluating specular microscopy report, majority of donor corneas in HCRP group were found suitable for OPK. An added advantage of HCRP is that younger donor corneas are easier to access and thus utilization rates both in terms of quantity and quality is better.

### Conclusions

HCRP is a better and much more effective system of corneal donor tissue retrieval in terms of both collection and utilization. However community participation through VED and pledged donations must continue.

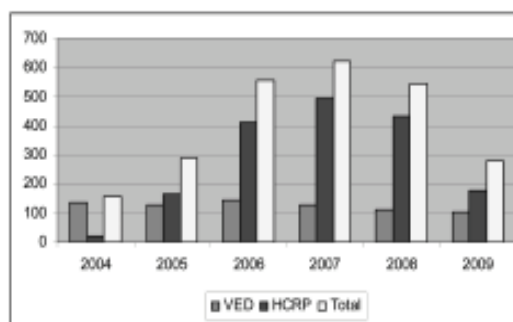


Fig 1 showing total collection of donor tissues in both the groups from 2004 to 2009

Collection	2004	2005	2006	2007	2008	2009	Total
VED	134	126	144	128	110	104	746
HCRP	22	164	410	494	432	176	1698
<b>Total</b>	<b>156</b>	<b>290</b>	<b>554</b>	<b>622</b>	<b>542</b>	<b>280</b>	<b>2444</b>

Table 2 showing total collection of donor tissues in both the groups of VED & HCRP from 2004 to 2009

	2004		2005		2006		2007		2008		2009		Total	
	C	U	C	U	C	U	C	U	C	U	C	U	C	U
<b>VED</b>	134	56	126	53	144	61	128	58	110	47	104	43	746	318
<b>HCRP</b>	22	5	164	85	410	196	494	241	432	304	176	90	1698	921

Table 3 showing total collection and Utilization of donor tissues in both the groups (VED & HCRP) from 2004 to 2009

	Total collection	Total Utilization	Utilization rate
VED	746	318	42.63%
HCRP	1698	921	54.24%

Table 4 showing Utilization rate of VED and HCRP from 2004 to 2009

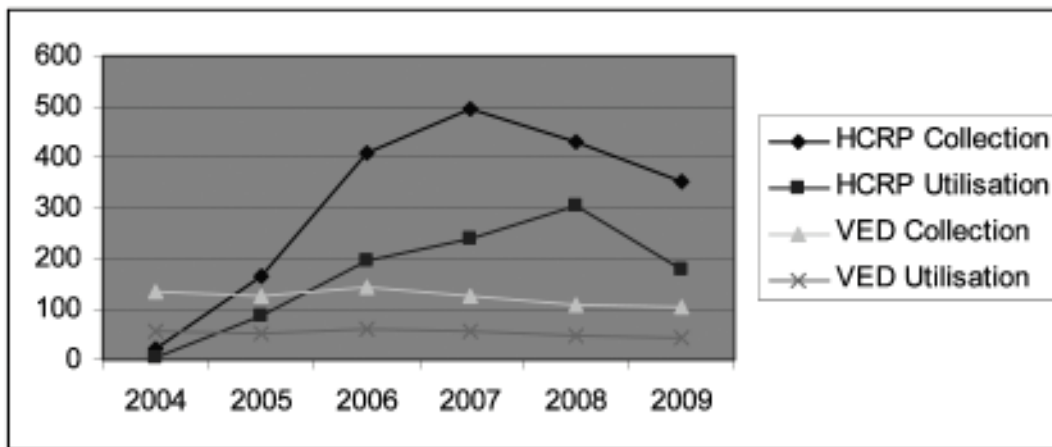


Fig 2 showing increasing total collection and utilization of donor tissues in the HCRP group and constant collection and utilization in VED group from 2004 to 2009

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