

Seroprevalence of Hepatitis-B Virus, Human Immunodeficiency Virus & Hepatitis-C Virus in Corneal Donors in Tertiary Care Centre, Ahmedabad



Microbiology

KEYWORDS : CORNEAL DONORS, HBV,HCV&HIV ANTIBODIES

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ABSTRACT

INTRODUCTION: Deceased eye donors provide corneal recipients, but also carry large risk of disease transmission. Routine serologic testing of cadaveric blood from eye donors aims to reduce the risk of transmission.

OBJECTIVES: To study the seroprevalence of HIV, HBV and HCV in corneal donors.

METHODS: Serologic testing of 746 eye donor samples for Hepatitis-B, Hepatitis-C and Human Immunodeficiency Virus was done and noted.

RESULTS: Out of 746 eye donors, 2 (0.27%) were positive for Anti-HIV antibody, 6 (0.80%) were positive for HBsAg antigen, 1(0.13%) was positive for Anti-HCV antibody.

CONCLUSION: Routine serology testing in corneal donors is mandatory to prevent disease transmission. Moreover, advanced techniques needed routinely to detect infection in window period.

INTRODUCTION

Transmission of infection through corneal transplant is a critical concern both to cornea recipient and to eyebank personnel. Deceased eye donors may provide grafts for several recipients, providing tremendous opportunities for sight restoration, but also carry some unquantifiable risk of disease transmission. Medical standards published by the Eye Bank Association of America (EBAA)¹¹ have been the benchmark for eyebank practice thereby assuring acceptable levels of quality and proficiency in dealing with corneal tissue for transplantation.

There has been documented evidence of transmission of Hepatitis-B virus through corneal grafts. Although there have been no reported cases of HIV and HCV transmission in corneal transplantation, there is always a risk from infected eye donor. Safety and validity of donor cornea is essential prerequisite for successful outcome of corneal transplantation. Routine serologic testing of cadaveric blood from eye donors aims to reduce the risk of transmission.

To determine the seroprevalence of HBV, HIV and HCV in our corneal donor population, we conducted a retrospective study of serological tests performed before corneal transplantation at M & J western regional Institute of Ophthalmology, BJMC, Ahmedabad. A total of 746 samples were evaluated from January 2010 to August 2013.

METHODS

At the time of enucleation of the eye from 746 eye donors, about 3-4 ml blood was collected by subclavian or internal jugular vein puncture. Cadaveric blood samples were stored at 2-8 degree celsius and were tested and reported within 12 hours of collection of eyes.

Antibodies to HIV were screened by rapid combaids, HBV was screened by one step HBV strip test and antibodies to HCV by HCV serum card. Positive samples were further confirmed by Enzyme Linked Immunosorbent Assay (ELISA).

All the tests were carried out as per manufacturer's instructions.

RESULTS

Out of 746 eye donor samples' testing conducted from January 2010 to August 2013:

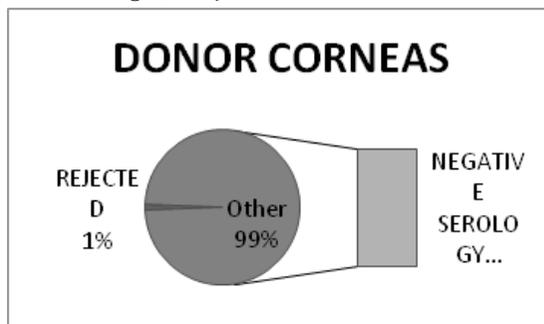
2 (0.27%) were positive for Anti-HIV antibodies.

6 (0.80%) were positive for HBsAg antigen.

1 (0.13%) was positive for Anti-HCV antibodies.

9 (1.21%) out of 746 corneas were rejected for transplant due to positive serology tests. (Fig.1)

FIG.1 showing % of rejected corneas:

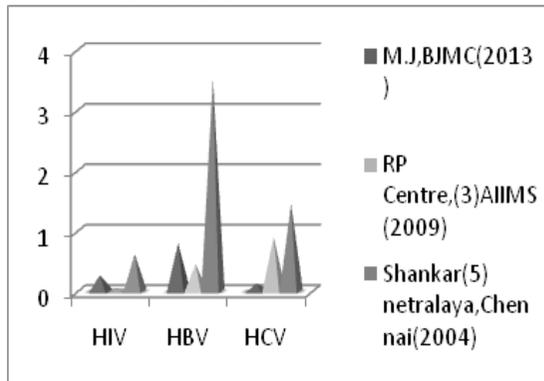


DISCUSSION

In our study, seroprevalence of HBV, HIV and HCV in eye donors is 0.80%, 0.27% and 0.13%. All the positive sera were positive for only one of the three viruses HBV/HIV/HCV.

Amongst similar studies conducted in India, at RP centre, AIIMS3, seroprevalence of HBV, HIV and HCV was 0.45%, 0.05% and 0.9%. At Shankar netralaya, Chennai5, seroprevalence of HBV, HIV and HCV was 3.52%, 0.62% and 1.45%.

SEROPREVALENCE OF HIV, HBV, HCV (INDIA) (in percentages) (Fig.2)

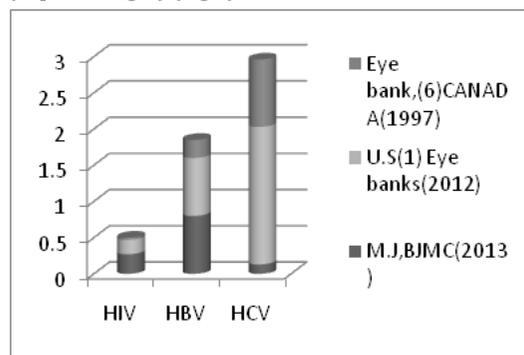


	M.J INSTITUTE, BJMC (2013)	R.P CENTRE, AIIMS(3) (2009)	SHANKAR(5) NETRALAYA, CHENNAI (2004)
HIV	0.27%	0.05%	0.62%
HBV	0.80%	0.45%	3.52%
HCV	0.13%	0.9%	1.45%

Table 1: comparative analysis nationally

Amongst similar studies conducted internationally, at US eye banks¹, seroprevalence of HBV, HIV and HCV is 0.8%, 0.2% and 1.9% and in Canada eye banks⁶, seroprevalence is 0.25%, 0.03%, and 0.93% respectively.

SEROPREVALENCE OF HIV, HBV, HCV (INTERNATIONALLY) (in percentages) (Fig.3)



	M.J INSTITUTE, BJMC (2013)	U.S EYE BANKS(1) (2012)	EYE BANK, (6) CANADA (1997)
HIV	0.27%	0.2%	0.03%
HBV	0.80%	0.8%	0.25%
HCV	0.13%	1.9%	0.93%

Table 2: comparative analysis internationally

There has been circumstantial evidence for transmission of HBV by corneal grafts. HBsAg and HBV DNA has been detected in corneas of infected donors¹⁰. The detection of viral genome correlates with presence of virions and is, therefore good marker of infectivity of tissue.¹⁰

Although corneas from HIV-1 seropositive donors are known

to have been transplanted, recipients didn't seroconvert and remained healthy^{8,10}. HIV-1 has been cultured from corneal specimens of carriers as well as AIDS patients¹⁰. HIV proviral DNA has been detected in about 86-95% of corneas from HIV-1 seropositive donors hence there is a potential for HIV transmission through cornea transplant.

Although to date, there have been no reported cases of HCV transmission by cornea transplants, there is a potential risk since Hepatitis-C is life threatening. HCV RNA has been detected in 34.5% of corneas of seropositive donors⁵.

Other infections known to have been transmitted to recipients by corneal transplantation are Creutzfeldt-Jakob Disease, Rabies¹⁰. Syphilis, Rubella and HTLV are also suspected of having this potential. However, the risk at present of any of these viruses is not sufficient to warrant routine screening for eye transplant¹⁰.

In our study, 1.21% corneas were not used for transplant due to positive serology tests.

Amongst similar studies in India, at AIIMS³, 1.9% corneas were rejected and at Shankar netralaya, Chennai⁵ 5.6% corneas were rejected to positive serology.

Internationally, in US¹ eye banks, 8.5% and in Canada⁶ eye bank, 1.20% corneas were rejected, compared to our study.

INDIA			
	M,J Institute, BJMC	R.P centre, AIIMS ³	Shankar netralaya, Chennai ⁵
	1.21%	1.9%	5.6%
INTERNATIONAL			
	M,J Institute, BJMC	U.S ¹ Eye Banks	Canada ⁶ Eye bank
	1.21%	8.5%	1.20%

Table 3: comparative analysis of rejected corneas nationally & internationally

CONCLUSION

Our study shows that Hepatitis-B infection is more prevalent in our cornea donor population followed by HIV and HCV infection. However, we could not detect the results of potential donors in window period of infection. Hence, more advanced molecular diagnostic techniques like PCR and Nucleic Acid Amplification Testing (NAAT) should be proposed routinely to detect infection in window period. This would also reduce the risk of transmission to recipients of corneal graft.

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