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ORIGINAL ARTICLE

The Prevalence Of HIV–2 Seropositivity In Blood Donors

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ABSTRACT

Blood transfusion has been the transmission mechanism in 15% of all the HIV infections. The HIV pandemic brought into focus the importance of a safe blood donor pool. In India, the HIV-2 epidemic occurs along with HIV-1. The analysis of HIV-2 screening was carried out in a tertiary care hospital among all the blood donors (2005-2009). Among 43130 blood donors, 350 (0.81%) were positive for HIV infection from which 304 (0.704%) were positive for HIV-1 and 46 (0.106%) were positive for the HIV-2 infection. We are showing here, the infection rate of HIV-2 among blood donors and the importance of promoting voluntary blood donations to ensure that the donors are free from transfusion transmissible infections like HBV, HCV, HIV-1 and 2 and Syphilis.

Key words: HIV, AIDS, Blood donor, ELISA, Western Blot.

Key message:
Transmission of HIV continues to be a threat to safe blood transfusion.
Unlike in the west, India is a country with a low epidemic of HIV-2 and hence, this has implications in HIV-2 transmission through the contaminated blood supply.
Various studies have reported a gradual increase in HIV prevalence in blood donors over the past two decades.

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The acquired immunodeficiency syndrome continues to spread unchecked since its first demonstration in 1981. Two decades later, nearly 50 million people are living with HIV/AIDS world wide according to UNIADS and WHO [1]. A major proportion of the infections is caused by the HIV-1 virus, which was identified in 1983 [2],[3].

The HIV-2 virus was first detected in West Africa [4],[5],[6]. HIV-2 was reported in India from Mumbai in 1991 and was detected in a high risk group of people and in professional blood donors [7],[8],[9].

The prevalence of HIV in various parts of India is different. It is particularly high in the western and the southern parts [10],[11]. The transmission of HIV continues to be a threat to safe blood transfusion. Developing countries account for >90% of all new HIV cases [12]. The major transmission mechanism for HIV has been through heterosexual contact (42%), blood transfusion (15%), and IV drug use (15%) [13]. Unlike in the west, India is a country with a low epidemic of HIV-2 and hence, this has implications in HIV-2 transmission through contaminated blood supply [14]. Various studies have reported a gradual increase in HIV

prevalence in blood donors over the last two decades and this observation generally reflects the trends seen in the sentinel surveillance [15]. Ever since the first report on HIV-2 infection from our laboratory in the Northern part of Karnataka, India, we have constantly seen HIV-2 positive cases among patients coming to our institution and hence, the detection of HIV-2 is also a major concern. There are not many reports from India on HIV-2 infection in blood donors [14] and hence, this study was conducted.

Materials and methods

This study was conducted for the prevalence of HIV-2 over a period of five years from January 2005 to December 2009 in a blood bank of S. Nijalingappa Medical College and Hanagal Shri Kumareshwar, a tertiary care hospital in the northern part of Karnataka.

(Table/Fig1) Total blood collection and distribution in different categories

YEAR	TOTAL NO OF DONORS	VOLUNTARY DONORS No (%)		REPLACEMENT DONORS No (%)	
		MALE	FEMALE	MALE	FEMALE
2005	3915	596 (15.22%)	59 (1.5%)	3126 (79.85%)	134 (3.42%)
2006	5795	623 (10.75%)	62 (1.07%)	4870 (84%)	240 (4.14%)
2007	9295	335 (3.6%)	40 (0.43%)	8388 (90.24%)	532 (5.72%)
2008	11115	233 (2.1%)	32 (0.29%)	10166 (91.5%)	684 (6.15%)
2009	13010	118 (0.91%)	22 (0.17%)	11913 (91.6%)	957 (7.36%)
TOTAL	**43130**	**1905 (4.41%)**	**215 (0.5%)**	**38463 (89.18%)**	**2547 (5.9%)**

A total of 43130 samples were collected from blood donors. The donors included both replacement as well as voluntary ones. Care was taken to exclude professional donors by taking appropriate history and examination.

All serum samples were screened for HIV 1and 2 antibodies by following the WHO/UNAIDS approved third generation ELISA kits. The tests were performed according to the manufacturer's instructions. All reactive samples were confirmed by using Western blot. The western blot positive samples were considered to be positive for HIV.

Out of 43130 blood donors, 41010 (95.09%) were replacement donors and 2120 (4.91%) were voluntary donors **(TABLE-1).** More than 90% of the donors were males of the middle age group, between 20-40 years. The replacement donors constitute the largest group in India [16], as in our study also, reflecting the lack of blood donation awareness among the general population.

Results

Ninty Five percent (Males-89.18% and Females-5.9%) of the 43130 blood donors were replacement blood donors, whereas only 5% (Males-4.41% and Females-0.59%) constituted the voluntary blood donors. Among the 43130 blood donors, 350 (0.8115%) were reactive for the HIV antibody during screening. All the positive samples were confirmed by western blot. Among these 350, 304 (86.85%) were positive for the HIV-1 infection and 46 were positive for the monotypic HIV-2 (13.15%)

(Table/Fig 2) The number of blood donors positive for HIV infection year wise.

YEAR	TOTAL NO OF BLOOD DONATIONS	TOTAL NO OF HIV POSITIVES	TOTAL NO OF HIV-2 POSITIVES
2005	3915	35 (0.89%)	4 (0.10%)
2006	5795	35 (0.60%)	6 (0.10%)
2007	9295	95 (1.02%)	9 (0.09%)
2008	11115	125 (1.12%)	17 (0.15%)
2009	13010	60 (0.46%)	10 (0.07%)
TOTAL	**43130**	**350 (0.8115%)**	**46 (0.106%)**

infection. The number of donors who were positive for the total HIV and the HIV-2 infections year wise (2005-2009) is given in **TABLE-2**. The age group of 15-30 years had the highest number of HIV-2 positives, accounting for 60.87% (28 out of 46) of the positivity, followed by 26% positivity in the age group of 31-45 years (12 out of 46) **TABLE-3.**

(Table/Fig 3) Age and sex wise distribution of HIV-2 positive individuals among blood donors

AGE (Yrs)	HIV-2 POSITIVES	
	MALE	FEMALE
15-30	23	5
31-45	10	2
46-60	5	1
TOTAL	**38**	**8**

Discussion

The HIV-2 epidemic was initially restricted to the West African countries [17]. The 1st case of the HIV-2 infection in India was reported from the state of Maharashtra in 1990. Later, it was reported from other parts of the country including the south Indian states [18].

The present study showed a 0.8115% (350) HIV infection rate among all the blood donors. Out of 350 HIV positive individuals, 46 (0.105%) were positive for the HIV-2 infection and 304 (86.85%) were positive for the HIV-1 infection.

A study by Thakral B et al [19], showed 0.16% seropositivity to the HIV-2 infection (64 positives out of 39784 donor units). In a study by Bharat Singh et al [20], the seropositivity for the HIV-2 infection was found to be 0.54% among 76089 blood donations. A five years study (1994-1999) among 46957 donors in North-Western India reported the overall HIV prevalence to be 0.44% more in replacement donors (0.46%), as compared to the Voluntary donors [21] (0.279%).

A study carried out by R Kannangai et al [14], showed the frequency of the HIV-2 infection to be 0.003% and that of HIV-1 to be 0.27% in a total of 175026 blood donations.

The prevalence of the HIV infection among non-professional blood donors at Christian Medical College and Hospital, Vellore, increased from 1.6 per 1000 in 1988-89 to 3.8 per 1000 in 1996-97 [22]. It is important to promote voluntary blood donations to ensure that the donors are free from transfusion transmissible infections like HBV, HCV, HIV-1and 2 and Syphilis [23].

As no such studies on HIV-2 have been conducted in this northern part of Karnataka and as this area has the highest prevalence rate of the HIV infection in India, we have conducted this study to document the prevalence rate of HIV-2 among blood donations.

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