

HIV Prevalence among Voluntary Blood Donors in Mumbai

Vikas C. Maindad*, Shilpa Laxmikant Narayankar*

*Assistant Professor, Dept. of Pathology, Grant Government Medical College Mumbai.

Abstract

Context: WHO reports that the viral dose in HIV transmission through blood is so large that one HIV positive transfusion leads to death, on an average after two years in children and after three to five years in adults. Transfusion medicine, apart from being important for the medical treatment of each patient, also has great public health importance. *Objectives:* The present study was conducted to estimate the prevalence of HIV infections in voluntary blood donors at a tertiary care teaching hospital in Mumbai. *Materials and Methods:* All voluntary donors reporting to the blood bank were screened for HIV by using the appropriate enzyme-linked immunosorbent assay. The study was designed for duration of seven years between January 2008 to December 2014. Medical reports of the donors were accessed from the blood bank records and analyzed. *Results:* A total of 5606 voluntary blood donors were screened, of which 5120 (91.33%) were males and 486 (8.67%) were females. The seroprevalence of HIV was 1.37%. *Conclusion:* Blood is still one of the main sources of transmission of HIV infections.

Keywords: HIV; Blood Donors.

Introduction

India has the third largest HIV epidemic in the world. In 2013, HIV prevalence in India was an estimated 0.3 percent. This figure is small compared to most other middle-income countries but because of India's huge population (1.2 billion) this equates to 2.1 million people living with HIV. WHO reports that the viral dose in HIV transmission through blood is so large that one HIV positive transfusion leads to death, on an average after two years in children and after three to five years in adults [1]. Transfusion therapy is a well-established treatment in various medical and surgical procedures [2]. Blood is one of the major sources of transmission of HIV hepatitis B, hepatitis C, syphilis, and many other diseases [3,4]. Discovery of these hazards brought a dramatic change in attitude of physicians and patients about transfusion of blood [5]. In July 1989, consequent to the reports of high seroprevalence in commercial blood

donors, mandatory screening of blood and blood products for HIV antibodies was initiated by Indian National AIDS Control Origination (NACO) [6]. The objective of this study is to estimate the seroprevalence of HIV among voluntary blood donors. This study provides idea of disease burden of the society.

Materials and Methods

A retrospective hospital record-based study was conducted at the blood bank of a tertiary care teaching hospital in Maharashtra, India. Data were collected for a period of 7 years from January 2008 to December 2014. Sera of voluntary blood donors from various localities and of different age groups was screened for HIV. A total of 5606 blood units were collected and studied. All voluntary blood donors were screened as per WHO criteria for blood donor selection. Five milliliter blood each was collected from subjects into plain, sterile tube following informed consent. Blood samples were centrifuged and the sera were separated and analyzed. Two kits were used based on WHO recommendation of two different testing strategies involving enzyme-linked immunosorbent assay

Corresponding Author: Shilpa Laxmikant Narayankar, Assistant Professor, Dept. of Pathology, Grant Government Medical College, J J Marg, Nagpada-Mumbai Central, Off Jijabhoy Road, Mumbai, Maharashtra 400008.
E-mail: Shilpathology@Gmail.Com

(ELISA) and/or simple or rapid assays for surveillance. Samples were analyzed for antibodies to HIV 1 and 2, by ELISA. Any serum found reactive by the first assay was retested using a second assay based on different antigen preparations and/or different test principle using the anti-HIV test. The validity of the test is assured as per the given criterion and the results were computed.

Results

In the present study, out of total 5606 voluntary blood donors, 5120 (91.33%) were males and 486

(8.67%) were females which show predominance of males as compared to females for the seven studied years [Table 1]. The prevalence of HIV among voluntary blood donors in the study population is showed in [Table 2].

The highest prevalence of HIV (40.2%) was within the age group 31-40 years, followed by 31.2% within the age group 21-30 years, with the lowest prevalence was observed within the age group of <20 years (7.8%) and ≥51yrs (6.5%) [Table 3].

Sex distribution pattern of voluntary blood donors for HIV prevalence shown in [Table 4]. Prevalance of HIV is more in males as compared to females.

Table 1: Distribution of voluntary blood donors in the study population

Year	Total voluntary donors	Male	Female
2014	687	613 (89.2%)	74 (10.77%)
2013	1084	965 (89.035)	119 (10.97%)
2012	1024	934 (91.22%)	90 (8.780%)
2011	754	701 (92.98%)	53 (7.02%)
2010	438	413 (94.3%)	25 (5.70%)
2009	702	645 (91.89%)	57 (8.11%)
2008	917	849 (92.59%)	68 (7.41%)
Total	5606	5120 (91.33%)	486 (8.67%)

Table 2: Prevalence of anti-HIV among voluntary blood donors in the study population

Year	Total no.of donors	Reactive for Anti-HIV	
		Number	Percentage
2014	687	03	0.30%
2013	1084	18	1.66%
2012	1024	11	1.07%
2011	754	15	1.98%
2010	438	00	00%
2009	702	07	0.99%
2008	917	23	2.50%
Total	5606	77	1.37%

Table 3: Distribution of blood donors with anti-HIV according to the age

Age (years)	Reactive for anti-HIV	
	Number	Percentage
<20	6	7.8%
21-30	24	31.2%
31-40	31	40.2%
41-50	11	14.3%
51-60	5	6.5%
Total	77	100%

Table 4: Distribution of blood donors with anti-HIV according to the sex

Sex	HIV	
	Number	Total Percentage
Males (5120)	73 (1.42%)	94.80%
Females (486)	04 (0.82%)	5.205%
Total (5606)	77 (1.37%)	100%

Discussion

Blood transfusion is an integral and life-saving procedure of modern medicine, but simultaneously it carries the risk of transmitting the life threatening transfusion transmissible infections. Blood transfusion

is a potential route of transmission of HIV [7,8], Transmission of HIV during the serologically window period still poses a threat to blood safety.

In the present study, voluntary blood donors shows male predominance (91.33%) which correlates with Giri et al [9] (2012) (95.28%). Bala et al [10] (2014)

stated that women experience up to 70% more deferrals from donation than men, because of higher frequencies of anaemia, other health problems and of adverse reactions. Vasovagal reactions and post-donation fatigue appear more to be in females as compared to males [10].

In our study, the prevalence of HIV was found to be 1.37 %, while other studies like Giri et al [9](2012) 0.07%, Gupta et al [11](2004) 0.084%, Chatteraj et al [12] (2008) 0.13%, Karkee et al [13] 0.19%, Matee et al [14] (2006) 3.8%, Dessie et al [15] (2007) 11.7% reported variable prevalence which may be due to geographical variations. Laghawe et al [16] (2015) stated that the spread of HIV in India has been uneven. Although much of India has a low rate of infection, certain places have been more affected than others. HIV epidemics are more severe in the southern half of the country and the far north-east[16].

Prevalence of HIV was highest in the age group of 31-40yrs (40.2%) followed by 21-30yrs (31.2%) in our study, while Sherwal et al [17](2015) and Giri et al [9](2012) noted highest HIV prevalence in the age group of 25-34 yrs(35.41%) and 21-30yrs (80%) respectively. In India, 89% of the cases occur among sexually active persons aged 20 - 49 years[16].

The HIV antibody test offers the advantages of simplicity and cost effectiveness for verifying infection, but it is less than perfect because of the possibility of transfusing antibody negative unit from a donor in the window phase of HIV infection. Newer technologies exist that can contribute to an accurate diagnosis, assist in monitoring the response to therapy, and can be used to effectively predict disease outcome. Viral isolation through viral culture, nucleic acid tests to detect viral RNA, and tests to detect p24 antigen can be used to demonstrate virus or viral components in blood, thereby verifying infection and potentially reducing the risk of transfusion of blood in the window phase of HIV infection[18].

Effective control strategies including a sensitive and stringent screening of all blood donors, public awareness programs, and institution of adequate public health measures are urgently needed. It may be possible through proper donor selection and education, uniform implementation of laboratory screening tests, and adequate supply of blood through voluntary blood donations along with restriction of donation by professional donors [9].

Conclusion

Blood transfusion is a double edge sword, which

should be used judiciously. Though blood transfusion can be life saving, it can also lead to infections. The currently used donor screening tests need to be revalidated or replaced to prevent false-negative diagnoses. All sectors need to optimally implement and control both, the quality of blood donors and the mandatory screening of blood and blood products against the TTIs along with prospective longitudinal data and follow up of patients. Availability of safe blood for transfusion is a must for the recipients and the community as well.

References

1. NACO Annual report 2012-2013.
2. Isbister JP. Risk management in transfusion medicine. *Transfus Med.* 1996; 10: 183-202.
3. Grgicevic D, Balija M, Pirc-Tiljak D, Mihaljevic I, Gjenero-Margan I, Zupancic Salek S. Decreasing risk of viral transfusion-transmitted diseases in Croatia. *Croat Med J.* 2000; 41: 191-6.
4. Chaudhary IA, Samiullah, Khan SS, Masood R, Sardar MA, Mallhi AA. Seroprevalence of HBV and C among health donors at Fauji Foundation Hospital, Rawalpindi. *Pak Med J.* 2007; 23: 64-7.
5. Mujeeb SA, Kausar A, Khalid M. Seroprevalence of HBV, HCV, and HIV infection among college going voluntary donors. *J Pak Med Assoc* 2000;50:269-70.
6. Kar HK. Global and National overview of HIV/AIDS epidemic. In: Sharma VK, editor. *Sexually transmitted diseases and HIV/AIDS.* 2nd ed. New Delhi: Viva Books Pvt. Ltd; 2009. p. 99-109.
7. Irshad M, Peter S. Spectrum of viral hepatitis in thalassaemic children receiving multiple blood transfusions. *Indian J Gastroenterol.* 2002; 21: 183-4.
8. Mollah AH, Nahar N, Siddique MA, Anwar KS, Hassan T, Azam MG. Common transfusion-transmitted infectious agents among thalassaemic children in Bangladesh. *J Health Popul Nutr.* 2003; 21: 67-71.
9. Giri P A, Deshpande J D, Phalke D B, Karle L B. Seroprevalence of transfusion transmissible infections among voluntary blood donors at a tertiary care teaching hospital in rural area of India. *J Family Med Prim Care.* 2012 Jan-Jun; 1(1): 48-51.
10. Bala S S, Handoo S, Jallu A S. Gender Differences in Blood Donation among Donors of Kashmir Valley. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* e-ISSN: 2279-0853, p-ISSN: 2279-0861. Feb. 2015; 14(2) Ver I: PP 116-119.
11. Gupta N, Vijay Kumar, Kaur A. Seroprevalence of HIV, HBV, HCV, and Syphilis in voluntary blood donors. *Indian J Med Sci.* 2004; 58: 255-7.
12. Chatteraj A, Bhel R, Kataria V. Infectious disease

- markers in blood donors. Med J Armed Forces India. 2008; 64(1): 33-5.
13. Karkee S, Ghimire P, Tiwari B, Shrestha A. Seroprevalence of HIV and Hepatitis C coinfection among blood donors in Katmandu valley, Nepal. Southeast Asian J Trop Med Public Health. 2009; 40(1): 66-70
 14. Matee M, Magesa PM, Lyamuya EF. Seroprevalence of human immunodeficiency virus, Hepatitis B and C viruses and Syphilis infections among blood donors at the Muhimbili National Hospital in Dar es Salam, Tanzania. BMC Public Health. 2006; 6: 21.
 15. Dessie A, Abera B, Fissehawale. Seroprevalence of major blood borne infections among blood donors at Felege Hiwot referral hospital, Northwest Ethiopia. Ethiop J Health Dev. 2007; 21: 68-9.
 16. Laghawe A, Faujdar S. Declining Trends in HIV Prevalence: A Tertiary Care Hospital Based 05 Years Retrospective Analysis. International Journal of Current Microbiology and Applied Sciences ISSN: 2319-7706. 2015; 4(6): pp. 927-936.
 17. Sherwal B L, Gupta P, Nayak R, Gogoi S, Suri S, Dutta R. Prevalence of HIV in a Tertiary Care Centre in Delhi: A Five-Year ICTC Based Study. World Journal of AIDS. 01/2015; 05(01): 1-9.
 18. Osaro E, Mohammed N, Zama I, Yakubu A, Dorcas I, Festus A, Kwaifa I, Sani I. Prevalence of p24 antigen among a cohort of HIV antibody negative blood donors in Sokoto, North Western Nigeria - the question of safety of blood transfusion in Nigeria. Pan Afr Med J. 2014; 18: 174.

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