



ANALYSIS OF SEROPREVALENCE OF HIV AMONG BLOOD DONORS IN BLOOD BANK BY RETROSPECTIVE STUDY

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ABSTRACT **AIM:** To find out the seroprevalence of human immunodeficiency virus in blood donors and assess the age group affects more.

METHOD: Tests are routinely done on every blood unit to exclude HIV. Donors were selected by the standard criteria for donor fitness. The screening for HIV was done by ELISA using kits.

RESULT: Majority of donors are voluntary donors (73.85%) and male donors (97.66%). Seroprevalence of HIV for all age donors 0.185% (79 cases). Age groups 26-35 year are affected more and show higher seroprevalence 0.105% (45 cases).

CONCLUSION: This high prevalence of transfusion transmitted disease in youth suggests a potential public health problem. Introducing nucleic acid testing (NAT) for HIV is recommended to detect the infection during window period. Screening and better selection of donors are necessary to improve blood safety in the regional blood transfusion centers.

KEYWORDS : HIV, Seroprevalence, Donors, ELISA

INTRODUCTION

The Blood safety remains a major public health problem in India. The backbone of a well-organised blood transfusion service is the recruitment and retention of voluntary, non-remunerated, low-risk blood donors. Screening for transfusion-transmissible infections such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and syphilis is also essential for blood transfusion safety and protecting human life (1).

Blood transfusion can be a life saving intervention. However, like all treatments it may result in acute or delayed complications and carries the risk of transfusion-transmissible infections. Appropriate clinical use of blood and supply of safe blood and blood products can minimize such complications and risks (2).

Blood transfusion has been used since 1930 for various indications. Transfusion therapy is a well established treatment in various medical and surgical procedures. Transfusion medicine, apart from being important for the medical treatment of each patient, also has a great public health importance worldwide. After introduction of blood banks and better storage techniques, it became more widely used (3).

MATERIAL AND METHOD

The present study is being undertaken in the Department of Pathology MGM Medical College Indore. This is a retrospective study that will be conducted, during the period 2008 –2010. Tests are routinely done on every blood unit to exclude HIV, HBV, HCV, syphilis and malaria. Donors were selected by the standard criteria for donor fitness. The screening for HIV was done by ELISA using kits.

ABO and Rhesus (Rh) blood groups were determined using blood grouping antisera: anti-A, anti-B, anti-AB, and anti-D. Selection of cases for the study included the donors of MYH Blood Bank.

SEROLOGY

The serum was tested for HIV antibodies by an enzyme immunoassay. Qualisa HIV1/2 is an Enzyme Linked Immunosorbent Assay (ELISA), which employs highly purified synthetic peptides representing most conserved antigenic segment of envelop glycoprotein, gp120 and gp41 of HIV-1 and gp36 of HIV-2.

RESULTS

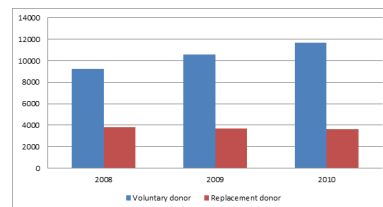
The present study is conducted in the Department of Pathology MGM Medical College Indore and M. Y. Hospital blood bank. This is a retrospective study that was conducted, during the period 2008 –2010. In the present study, 42582 blood donors are observed in the year 2008-10 in the M. Y. Blood Bank. The data collected from donor register record book, donors form, master record book, HIV positive beg numbers records.

Results and observations are summarized as follows

1. Out of total 42582 blood donations, majority of donors are voluntary donors 73.85% (31446 cases) as compared to replacement/relative donors 26.15% (11136 cases).
2. Out of total 42582 blood donations, majority of donors are male donors 97.66% (41586 cases) as compared to female donors 2.34% (996 cases).
3. Seroprevalence of HIV for all age donors 0.185% (79 cases)
4. Seroprevalence is higher in the age group 26-35 year for HIV 0.105% (45 cases)

Table 1: Number of blood units collected during the year 2008-10.

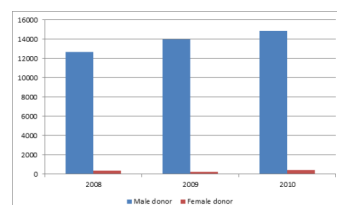
Year	Units Collected	Voluntary donor	Replacement donor
2008	13052	9238 (70.78%)	3814 (29.22%)
2009	14226	10557 (74.20%)	3669 (25.80%)
2010	15304	11651 (76.14%)	3653 (23.86%)
Total	42582	31446 (73.85%)	11136 (26.15%)



Graph 1: Number of blood units collected during the year 2008-10.

Table2: Number of male and female blood donors during the year 2008-10.

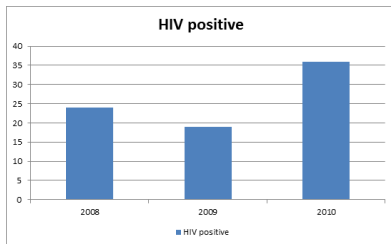
Year	Total collected units	Male donors	Female donors
2008	13052	12692 (97.24%)	360 (2.76%)
2009	14226	14013 (98.50%)	213 (1.50%)
2010	15304	14881 (97.24%)	423 (2.76%)
Total	42582	41586 (97.66%)	996 (2.34%)



Graph 2 : Number of male and female donors during the year 2008-10.

Table 3: Result of seropositive donor blood samples for HIV.

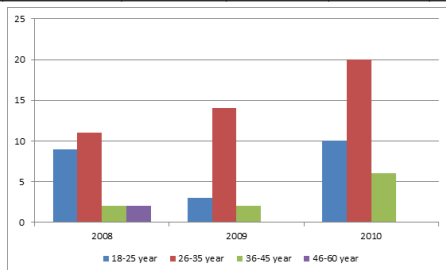
Year	Total units	HIV positive
2008	13052	24 (0.184%)
2009	14226	19 (0.113%)
2010	15304	36 (0.235%)
Total	42582	79 (0.185%)



Graph 3 : Seropositive donors for HIV in 2008-10

Table 4: Age wise distribution of Seroprevalence of HIV in the year 2008-10

Year	Age Group (in years)				Total
	18-25	26-35	36-45	46-60	
2008	09 (0.068%)	11 (0.084%)	02 (0.015%)	02 (0.015%)	24 (0.184%)
2009	03 (0.021%)	14 (0.098%)	02 (0.014%)	00 (00%)	19 (0.113%)
2010	10 (0.065%)	20 (0.130%)	06 (0.039%)	00 (00%)	36 (0.235%)
Total	22 (0.051%)	45 (0.105%)	10 (0.023%)	2 (0.004%)	79 (0.185%)



Graph 4 : Age wise distribution of HIV in the year 2008-10.

DISCUSSION

Voluntary or Replacement/Relative Donor - In our study, out of total 42582 blood donations, majority of donors are voluntary donors 73.85 % as compared to replacement/relative donors 26.15 %. Similarly majority of donors are voluntary in another study out of 19135 blood donors, 11165 (58%) were voluntary and 7970 (42%) were replacement/relative donors by Nagarekha Kulkarni Associate Professor, Department of Pathology, Vijayanagara Institute of Medical Sciences, Bellary - 583104, Karnataka, India(4).

Male or Female Donor - In our study, out of total 42582 blood donations, majority of donors are male donors 97.66 % (42586) as compared to female donors 2.34 % (996). Similarly another study is comparable for majority of donors are male 96.22% by Dimple Arora and Bharti Arora in Haryana et al(5).

Majority of the donors (~98%) were male which is comparable to the study done by Rao, et al; Annapurna et al in KEM Hospital Pune and Arora et al in Southern Haryana(6).

Similarly in another study total of 6361 consecutive blood donors were screened at Gondar University Teaching Hospital blood bank unit during the study period. Of these, 5592 (87.9%) donors were males and 769 (12.1%) were females (7).

In the another study, the percentage of male patients was 73% (860/1178) as compared with 27% (318/1178) for female patients by Manisha Jain and Anita Chakravarti et al. conducted in New Delhi(8).

Similarly majority of donor are male in 3418 (75.62%) donors were male and 1102 (24.38%) were female by Marius Bolni Nagalo and Mahamoudou Sanou et al conducted in Koudougou(1).

Seroprevalence of HIV - In our study, the seroprevalence of HIV 0.185 % in total blood donations in the year 2008-10. Seroprevalence of HIV is low as compared to another study 0.3% in total donors by Dimple Arora and Bharti Arora et al conducted in Haryana(5), Ramanamma *et al* in Vishakapatnam, Shashikala *et al* in North Karnataka and Kulkarni *et al* in Mumbai.

In another study, the seroprevalence of antibodies to HIV in hospital population was 0.35% by Smita Sood and Shirish Malvankar et al conducted in Rajasthan(9). This is in accordance with the 2006 estimates of NACO (National AIDS Control Organization), NIHWF (National Institute of Health and Family Welfare), and NMS (National Medical Statistics) which suggest that the national adult HIV prevalence in India is 0.36%.

The prevalence of HIV in the low-risk group of hospital patients comprising medical, surgical patients and antenatal cases at the University Hospital of BHU, Varanasi, has been reported as 0.37%. by Mukhopadhyay C, Nath G et al(10).

Our seroprevalence of HIV is very low as compared with another study, the overall seroprevalence of HIV was 2.21% by Marius Bolni Nagalo and Mahamoudou Sanou et al conducted in Koudougou(1).

Seroprevalence of HIV is low as in another study seroprevalence of HIV was 0.91% Nagarekha Kulkarni in Karnataka(4).

In our study seroprevalence is low as compared to overall seroprevalence of HIV (3.8%) by Belay Tessema and Gizachew Yismaw et al conducted in University of Gondar, Ethiopia and 3.8% seroprevalence in Ghana by Ampofo W, Nii-Trebi N et al in Ghana(7).

Age wise distribution - In our study, Seroprevalence is higher in the age group 26-35 year for HIV-0.105 %. In another study, the highest seroprevalence for anti-HIV was found in the age group 31-40 years by Smita Sood and Shirish Malvankar et al conducted in Rajasthan(9).

In another study, 3 positive cases belonged to 21-40 years age group by S Mishra and N Chayani et al conducted in Orissa(11).

The seroprevalence of HIV was significantly lower among blood donors aged between 30 and 40 years old (1.18%) compared to that in subjects over 40 years old (3.70%) by Marius Bolni Nagalo and Mahamoudou Sanou et al conducted in Koudougou.

CONCLUSION

The present study is conducted in the Department of Pathology MGM Medical College Indore and M. Y. Hospital blood bank. This is a retrospective study that was conducted, during the period 2008 –2010. In the present study, 42582 blood donors are observed in the year 2008-10 in the M. Y. Blood Bank. All work is carried out under the professional guidance of Department of Pathology, M.Y. Hospital.

In our study, 3 year period from 2008 to2010 total 42582 units of blood was collected. Majority of donors are voluntary donors (73.85%) and male donors (97.66%).Seroprevalence of HIV for all age donors 0.185 % (79 cases). Age groups 26- 35 year are affected more and show higher seroprevalence 0.105 % (45cases)

This high prevalence of transfusion transmitted disease in youth suggests a potential public health problem.

HBV and HIV are the most prevalent transfusion-transmissible diseases among blood donors in Indore. Screening and better selection of donors are necessary to improve blood safety in the regional blood transfusion centre of M. Y. Hospital.

Therefore, it is concluded that voluntary blood donation should be encouraged for prevention of transfusion-transmissible diseases. The time and cost involved in screening donated blood can be reduced by

an effective donor education and selection program that promotes self-exclusion by donors at risk of transfusion-transmissible infections.

Introducing nucleic acid testing (NAT) for HIV, HBsAg and HCV is recommended to detect the infection during window period.

Acknowledgement

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