VOLUME - 11, ISSUE - 02, FEBRUARY - 2022 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Pathology

SEROPREVALENCE OF HIV IN BLOOD DONORS AT TERTIARY CARE BLOOD CENTRE IN MUMBAI

Mrs. Kalpana U. Shinde	JSO, Blood Bank, Department of Pathology, T.N.M.C. and B.Y.L. Nair Charitable Hospital, Mumbai central, Mumbai 400008.
Dr. Vikas S. Kavishwar*	Professor (Additional), Department of Pathology, T.N.M.C. and B.Y.L. Nair Charitable Hospital, Mumbai central, Mumbai 400008. *Corresponding Author
Dr.(Mrs.) Varsha M.Dhume	Associate Professor, Department of Pathology, T.N.M.C. and B.Y.L. Nair Charitable Hospital, Mumbai central, Mumbai 400008.
Mr. Umesh R. Shinde	JSO, Department of Biochemistry, T.N.M.C. and B.Y.L. Nair Charitable Hospital, Mumbai central, Mumbai 400008.
Mrs. Vidya P.Das	JSO, Department of Anaesthesiology (EMS Department), L.T.M.M.C. and L.T.M. General Hospital, Sion, Mumbai 400022.
Mrs. Vandana P. Kambli	JSO, Department of Pathology (Emergency Lab), Kasturba Hospital for Infectious Diseases, Sane Guruji Marg, Chinchpokli, Mumbai 400011.

ABSTRACT

Background: Transfusion transmissible infection (TTI) can be a potential complication of blood transfusion, which is preventable with appropriate care at various steps. Detecting HIV in blood donors is essential for safety in blood transfusion practice. This study was aimed to determine the Seroprevalence of HIV in blood donors at tertiary care centre.

Material And Methods : Total 62948 blood units were collected from voluntary blood donors over period from 1st January 2016 to 31st December 2020. The microwell Enzyme Linked Immunosorbent Assay (ELISA) method was used to screen for antibodies against Human Immunodeficiency Virus (HIV).

Results: Out of total 62948 blood donors, indoor donors were 6110 (9.71%) while outdoor donors were 56838 (90.29%). Total 61 samples (0.10%) were HIV reactive, including 7 from indoor (0.11%) and 54 from outdoor (0.10%) donors.

Conclusion: Seroprevalence of HIV is low in indoor and outdoor donors due to strict selection criteria of blood donors. Screening of blood samples using standard methods are highly recommended to ensure the safety of blood for recipient.

KEYWORDS : Blood donors, HIV seroprevalence, Transfusion transmissible infection (TTI)

INTRODUCTION

Blood transfusion carries the risk of Transfusion Transmissible Infection (TTI) including HIV, hepatitis, syphilis, malaria & less frequently toxoplasmosis brucellosis & some viral infection. According to the World Health Organization (WHO) guidelines screening of all blood donor units for TTI is mandatory.

HIV (Human immunodeficiency virus) is the cause of the fatal condition called acquired immunodeficiency syndrome (AIDS). It was first recognized in the United States in 1980-1981 in homosexual men[1]. India has the third largest HIV prevalence in the world with 2.1 million of HIV Cases. The aim of this study was to determine the seroprevalence of HIV in the blood donors at tertiary care Hospital.

MATERIAL AND METHODS

This study was conducted in blood centre of a tertiary care hospital from 1st January 2016 to 31st December 2020. Total 62948 blood units were collected from indoor and outdoor voluntary donors and screened for detection of antibodies against human immune deficiency virus (HIV) by micro well Enzyme Linked Immunosorbent Assay (ELISA) method. Merilisa HIV 1-2 Gen3 is an enzyme immunoassay for the quantitative determination of antibodies to HIV Type 1(HIVI) & Type 2 (HIV2) in human serum or plasma. In this test two positive Controls & Three negative Controls are used to ensure that test is working correctly.

Inclusion Criteria:

Clinically healthy individuals between the age 18 to 65 years with the body weight of above 45 kg and haemoglobin >12.5g/dl, with no apparent medical or surgical illness, were selected as voluntary donors at blood donation camps (Outdoor) and at the blood centre (Indoor) for voluntary donation.

Exclusion Criteria:

Individuals with recent medication, history of blood donation within < 3 months duration, history of recent illness like malaria, typhoid etc, history of long-term illness like tuberculosis, history of allergic reactions, history of significant medical & Surgical interventions and also pregnant & lactating women.

Procedure :

A written informed consent was taken from each donor. Name, age, sex, contact number, address were recorded for each donor and unique identification number was given to the donors. Detailed history of immunization was taken. Weight, Pulse, blood pressure, body temperature were recorded. Proper sterilization and other precautions were taken during the blood Collection and blood units were stored by appropriate methods. Blood samples were collected in plain vacutainer. All serum samples were screened by micro well ELISA for antibodies against HIV in serum.

RESULTS

Out of total 62948 blood donors, indoor donors were 6110 (9.71%) while outdoor donors were 56838 (90.29%). Total 61 samples (0.10%) were HIV reactive, including 7 from indoor (0.11%) and 54 from outdoor (0.10%) donors [Ref. Table 1].

Out of 61 HIV positive donors, one donor was coinfected with HBV, one donor was coinfected with HCV and one donor was also reactive for VDRL.

Table 1: Year Wise Distribution Of Seroprevalence For HIV.

Year	Indoor Voluntary donor	Positive indoor donor	Outdoor Voluntary donor	Positive outdoor donor	Total no. of HIV positive cases	Total no. of donors
2016	1792	00(0.00%)	11770	14(0.12%)	14(0.10%)	13562
2017	1139	03(0.26%)	11393	15(0.13%)	18(0.14%)	12532
2018	1359	02(0.15%)	13008	15(0.125%)	17(0.12%)	14367
2019	1312	00(0.00%)	13526	07(0.05%)	07(0.05%)	14838
2020	508	02(0.34%)	7141	03(0.04%)	05(0.06%)	7649
Total	6110 (9.71%)	07	56838 (90.29%)	54	61 (0.10%)	62948

DISCUSSION

HIV is a major threat to safe blood transfusion in India. Much emphasis is laid on preventive aspects as there is no complete cure once the infection is acquired through blood transfusion. Mostly HIV infection are transmitted through sexual contact with an infected partner. HIV can be present in semen, vaginal, cervical secretions & blood. HIV can be transmitted through blood transfusion & reuse of inadequately sterile needles. Hence safe blood transfusion practices should be encouraged.

The various studies of seroprevalence of HIV were carried out in different region of India. Seroprevalence of HIV infection among blood donors in various regions of India has been found to be in the range of 0.15% to 0.51%. [Ref. Table 2]

Table 2. Seroprevalence Of HIV Infection Among Blood Donors In Various Regions Of India.

Study	Seroprevalence (%)
Shah et al[2], Gujarat	0.15
Arora et al[3], Southern Haryana	0.3
Das et al[4], Kolkata	0.32
Makroo et al[5], Delhi	0.25
Sharma et al[6], Gwalior	0.19
Pallavi et al[7], Mysore	0.49
Chandra et al[8], Lucknow	0.23
Sawke et al[9], Bhopal	0.51
Present study	0.10

Seroprevalence of HIV in present study was 0.10%, lowest as compared to most of the Indian studies (Table 2). It was somewhat comparable with studies by Shah et al[2] in Gujrat (0.15%) and Sharman et al[6] in Gwalior (0.19%). Relatively higher prevalence was reported in studies by Sawke[9] et al Bhopal (0.51%), Pallavi et al[7] Mysore (0.49%) Das et al[5]Kolkata (0.32%). The variation is related to applying stringent criteria for selection of blood donors and appropriate method of testing.

In our study the percentage of positive cases in outdoor voluntary donors & indoor voluntary donors were approximately same. This is due to uniformly stringent criteria applied in selection of any blood donor, whether indoor or outdoor. Sometimes there is a tendency in donors to give incomplete history when they are donating blood as a replacement for their patients. Hence, it is prudent to encourage voluntary donation.

In our study we observed higher HIV seroprevalence among male (0.10%) as compared to female (0.05%) donors. The reason could be lower participation in blood donation camps by female due to lower body weight & anaemia.

HIV is a major threat to safe blood transfusion in India. Much emphasis is laid on Preventive aspects as there is no complete cure once the infection is acquired. In a study done by Shah et al[3] in Gujrat the seroprevalence of HIV among blood donors was 0.15% (Table 2) and Sharma et al[7] in Gwalior the Seroprevalence of HIV among blood donors was 0.19% (Table2). In the present study, the overall seroprevalence of HIV among blood donors was (0.10%). The Percentage positive Cases in outdoor voluntary donors and indoor voluntary donors are approximately same. The reason for the low seroprevalence could be due to increasing awareness among the population regarding AIDS and effectiveness of the various control programs. Most HIV infections are transmitted through sex with an infected partner. HIV is present in in Semen, vaginal, cervical secretions and blood. These are the main vehicles by which the virus is transmitted. HIV being transmitted by blood transfusion also and reuse of inadequately sterile needles. Hence safe blood transfusion practices should be encouraged.

In a study done by Neto et al[10] in Curitiba Brazil the seroprevalence among male donors was 0.155%. and among female doners was 0.132%. In our study also, Males show more seropositivity than female. The reason could be no lower participation by females due to lower body weight & anaemia. In the Present study highest seroprevalence observed in the age group 25 to 35 years. A study done by Makroo et al[5] showed highest seroprevalence in the age group 18-30 years.

With Elisa test, the early stage of HIV infection might be missed. Nucleic acid testing (NAT) is a more sensitive molecular technique for screening blood donations. It reduces the window period by 10-33 days but NAT test is quite expensive compared to Elisa & not routinely used for screening.

Co-infection means living with two or more viruses at the same time. In the present study. out of 61 HIV positive donors, one donor is co-infected with HBV, one donor is co-infected with HCV. Co-infection with HIV with hepatitis C & B virus may accelerate the progression of liver disease. One donor showed reactivity also for VDRL. Syphilis is a complex disease, which is sexually transmitted. The incidence of syphilis is rising all over the world, partly due to increased transmission in HIV patients and other high-risk groups.

CONCLUSION

Meticulous screening and application of strict blood donor selection criteria can be useful in reducing the prevalence of HIV infection in indoor as well as outdoor voluntary donors. These practices are highly recommended to ensure the safety of blood for recipient. The donors screening protocol can be strengthened by using more sensitive techniques like NAT, CLIA.

REFERENCES

1. Dr. Praful Godkar, Ph.D. and Dr. Darshan Godkar, M.D. Text Book of Medical laboratory Technology, 2nd Edition 2003; 677.
2. Shah N, Shah JM, Jhaveri P, Patel K, Shah CK, Shah NR. Seroprevalence of HBV, HCV, HIV and syphilis among blood donors at a tertiary care teaching hospital in Western India. Gujarat Med J 2013;68(2):35 9.
3. Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. Indian J Pathol Microbiol. 2010; 53:308-9.
4. Das BK, Gayen BK, Aditya S, Chakrovorty SK, Datta PK, Joseph A. Seroprevalence of hepatitis B, hepatitis C and human immunodeficiency virus among healthy voluntary first-time blood donors in Kolkata. Ann Trop Med Public Health. 2011;4(2):86–90.
5. Makroo RN, Salil P, Vashist RP, Shivlal. Trends of HIV infection in the blood donors of Delhi. Indian J Pathol Microbiol 1996; 39:139-42.
6. Sharma DC, Jain A, Woike P, Rai S, Tripathi L, Bharat S. Prevalence of HIV infection among blood donors at a tertiary care centre in Gwalior, India. Int Blood Res Review. 2015;4(4):1-8
7. Pallavi P, Ganesh CK, Jayashree K, Manjunath GV. Seroprevalence and trends in transfusion transmitted infections among blood donors in a university hospital blood bank: a 5-year study. Indian Journal of Hematology and Blood Transfusion2011;27(1):1–6.
8. Chandra T, Kumar A, Gupta A. Prevalence of transfusion transmitted infections in blood donors: an Indian experience. Trop Doct 2009; 39:152–4.
9. Sawke N, Sawke GK, Chawla S. Seroprevalence of common transfusion transmitted infections among blood donors at Bhanpur, Bhopal, MP, from 2006–2008. Peoples J Sci Res 2010;3(1):5–7.
10. Neto JLA, Pintarelli VL, Felchner PCZ, Morais RL, Nishimoto FL. HIV prevalence among blood donors in a blood bank in Curitiba (Brazil). The Brazilian Journal of Infectious Diseases. 2002;6(1):15-21