

Research Article

Seroprevalence of HIV and Hepatitis-C infection among blood donors in Vijaypur district Karnataka, India-A Retrospective study.

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ABSTRACT:

This retrospective study was undertaken to know the Seroprevalence of HIV and HCV viral infections among blood donors of both sexes over a period of 2 years from January 2011 to December 2012. A total 3535 blood donors of both sexes were selected. 5ml blood was collected in a plain, sterile bottle. Sera separated by centrifugation analyzed by enzyme-linked immunosorbent assay and alternatively by rapid assays at Blood Bank of BLDE Shri B M Patil Medical college, Hospital and Research Centre Vijaypur. We found that prevalence of transfusion transmitted infections about 2.43% Male predominant amongst male donors i.e.1.78% of HBsAg compared to HIV 0.14% and , HCV 0.23% respectively. Amongst female donors i.e. 0.17% of HBsAg compared to HIV 0.17% and , HCV 0.35% respectively. No donor was found with positive for syphilis and malaria. By this study we conclude that it would be possible to screen a large population of donors for prevalence of HIV and HCV, and creating awareness among population about transfusion transmissible infection would lead to an effective control of transfusion transmissible infections.

Key words: Seroprevalence, HIV, HCV Infection, enzyme-linked, immunosorbent assay, blood donors

INTRODUCTION:

Blood transfusion is a one of life saving major, however transfusion of blood may result in acute or delayed complications and also carries the risk of transfusion transmissible infections such as HIV, hepatitis B & hepatitis C, syphilis and malaria etc.. Rational use of blood and its products can minimize such complications and risks of transfusion transmissible infections. The

evaluation of the data of the prevalence of the transfusion transmitted infections like Hepatitis B, Hepatitis C virus and HIV infections, among blood donors permits an assessment of the acquisition of the infections in the blood donor population and consequently the safety of the collected donations. It can also give an idea for the epidemiology of

these transfusion transmitted infections among community [1].

Human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) are life threatening infections because of their prolonged viraemia and carrier or latent state. They also cause fatal, chronic and life-threatening disorders. Blood transfusion accounts for 5-10% of HIV infections in sub-Saharan Africa[2].

Transfusion transmitted AIDS in mid-1980s raised the question of blood safety. As transfusion of whole blood or its components is an integral part of medical or surgical management and carries the risk of transmitting transfusion transmitted infections like hepatitis B & C, HIV, syphilis, malaria, but hepatitis B, hepatitis C and HIV are the most life threatening disorders. Hepatitis B and hepatitis C infections are the major blood transmitted diseases in the country. Blood from professional and family or replacement donors have proved to be unsafe because of high prevalence of these blood transmitted infections among them [3, 4].

India has a population of more than 1.2 billion with 5.7 (reduced to 2.5) million Human Immunodeficiency Virus (HIV) positive, 43 million positive for HBV-positive whereas 15 million were HCV-positive people [5].

MATERIALS AND METHODS:

The purpose of the present study was to determine the prevalence of serological markers of HIV and HCV among blood donors both voluntarily in camps and replacement.

This retrospective study was conducted over a period of two years from January 2011 to December 2012 at Blood Bank of BLDE University Shri B M Patil Medical College, Hospital and Research Centre Bijapur, Karnataka India. A total of 3535 voluntary and replacement blood donors were selected. Voluntaries of both male and female from blood donation camps of urban and rural population and also replacement

donors of Bijapur District Karnataka were included in this study. In this retrospective study we reviewed total 3535 healthy blood donors over a period of two years and they were carefully selected for donation by trained personnel after a complete physical and vital parameters examination.

Sample collection:

Five milliliter blood each was collected from donors in to plain, sterile bottle following informed consent. Blood samples were centrifuged and sera separated analyzed by enzyme-linked immunosorbent assay (ELISA ERBA Chemical kit) and alternatively by simple or rapid assays samples (Tri dot J. MITRA) are used for analyzing antibodies to HIV and HCV by ELISA. Results were computed. For testing VDRL (TRANSASIA Rapid TP Instate TP Card) and for malaria parasite (SD Malaccan Card) is used.

Satisfactorily answering the donor's questionnaire and Ethical clearance of the study was obtained from institutional ethical committee.

INCLUSION CRITERIA:

- 1) Donors weighing more than 50kg at period of three months intervals free from previous blood donations with normal blood pressure, pulse and a febrile
- 2) Donors of the age group of 18-60 years were taken

EXCLUSION CRITERIA:

- 1) Donors weighing less than 45 kg for males and less than 50 kg for females, less than period of three months intervals free from previous blood donations and recent history of surgery of 6 months and medication within 72hours.
- 2) Donors below age of 18 years and more than 60 years.

RESULTS:

In our study comprised of 3535 blood donors of both sexes we found that prevalent of transfusion transmitted infections about 2.43% .Male

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predominant amongst male donors i.e.1.78% of HBsAg compared to HIV 0.14% and , HCV 0.23% respectively. Amongst female donors i.e 0.17% of HBsAg compared to HIV 0.17% and, HCV 0.35% respectively. No donor was found with confirmed syphilis and malaria. Among male donors twenty three donors were positive for

transfusion transmissible infection in that predominantly were of younger age group between 20 to 40years. Tests done by enzyme-linked immunosorbent assay (ELISA) and by rapid spot method

Table 1 showing total number of donors in two years including both male and female donors during the Period of January 2011 to December 2012.

Study period 2years	Total donors	Male donors	Female donors
2011(Jan to Dec)	1113	863	250
2012(Jan to Dec)	2422	2111	311
Total	3535	2974	561

Table 2: showing incidence of HIV and HCV infection among male and female donors during Period of January 2011 to December 2012.

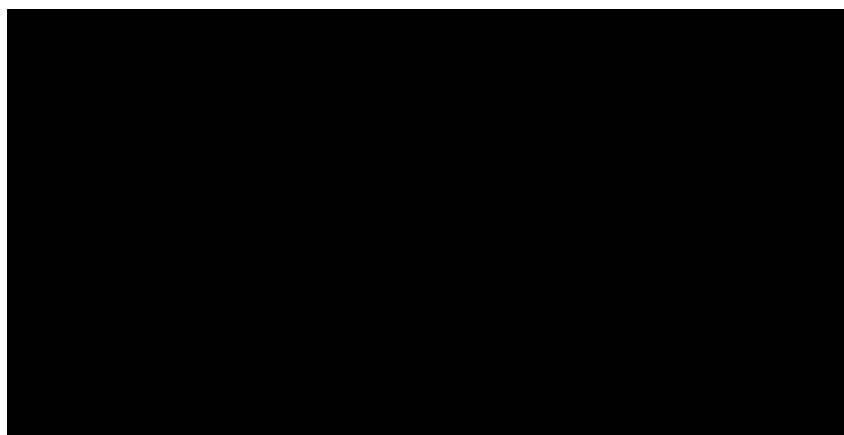
Study period 2years	HIV & HCV positive in male donors	HIV & HCV positive in female donors	Total number of HIV & HCV positive cases
2011(Jan to Dec)	00	00	00
2012(Jan to Dec)	HIV- 13 HCV -07	HIV- 01 HCV-02	HIV- 14 HCV-09

STATISTICAL ANALYSIS:

Table 3: Showing percentage of transfusion transmitted infections among blood donors of both sexes.

Total No. of blood donors including both sexes was 3,535.	HIV infection	HCV infection	HBsAg infection	VDRL & MP
2.43%	0.39%	0.25%	1.78%	00%
Male blood donors 2,974	0.43%	0.23%	2.0%	00%
Female blood donors 5,61	0.17%	0.35%	0.17%	00%

Graph 1: Number of cases positive of HIV, HBsAg and HCV



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Table 4: Showing age wise distribution of transfusion transmitted infections among blood donors .

Sl no	AGE	HIV	HBsAg	HCV	VDRL	MP
1	19-24	02	15	00	Negative	Negative
2	24-30	03	14	03	Negative	Negative
3	30-35	03	14	02	Negative	Negative
4	35-40	03	07	03	Negative	Negative
5	40-45	02	06	01	Negative	Negative
6	45-50	01	07	00	Negative	Negative

Graph 2: Number of cases of HIV, HBsAg and HCV

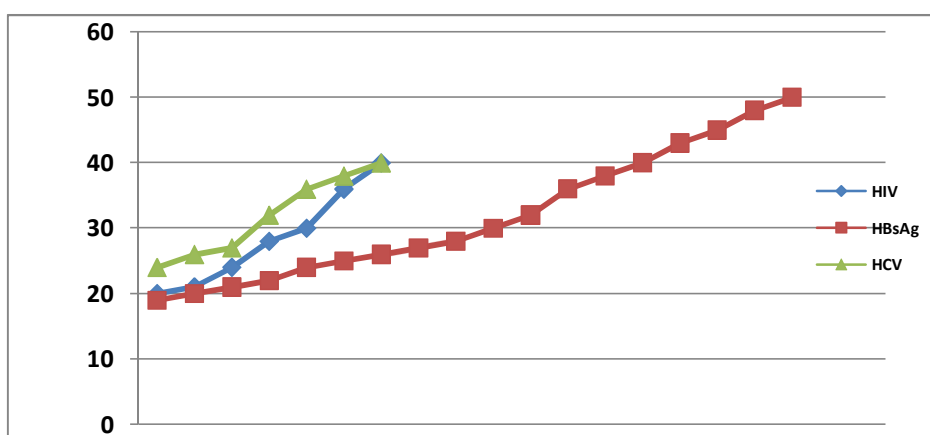


Table 5: Showing statistical analysis sex wise distribution of transfusion transmitted infections among blood donors of both sexes.

INFECTION	Male - 2794	Female-561	Total-3355	Statistical Test
HIV Positive	13	01	14	χ^2 (with yate's corrections)= 0.02038
HIV Negative	2781	560	3341	p = 0.8865 NS
HBsAg Positive	62	01	63	χ^2 =9.486(with yate's corrections)
HBsAg Negative	2732	560	3292	p = 0.0021 HS
HCV Positive	09	00	09	χ^2 =(with yate's corrections)= 0.8079
HCV Negative	2785	561	3346	p=0.3687

NOTE: - NS = No significant

HS = Highly significant.

P value for HIV negative donors , HBsAg negative donors and HCV negative donors were 0.8865, 0.0021 and 0.3687 respectively. P value was

highly significant in case of HBsAg negative donors but it was not significant in case of HIV negative donors and HCV negative donor.

DISCUSSION:

In our study total Number of blood donors comprising both sexes were 3,535 in that male Donors 2,794 whereas female donors were 561 Seroprevalence of transfusion transmitted infection positive among 86 donors in 2 years in those HIV Positive -14 HCV Positive -09 whereas HBsAg Positive were 63. Transfusion Transmitted infection among blood donors are more prevalent between 20 to 40 years age group. P value for HIV negative donors , HBsAg negative donors and HCV negative donors were 0.8865, 0.0021 and 0.3687 respectively. P value was highly significant in case of HBsAg negative donors but it was not significant in case of HIV negative donors and HCV negative donors.

Pallavi P et al said that transfusion of blood and blood products is a highly specialized modality for management of patient which has been saving millions of lives worldwide every year. Amongst the undesirable complications arising due to transfusion of blood and blood products, such as transmission of certain infections (TTIs) like HIV, Hepatitis B and C and syphilis are most significant for the long term detrimental side effects. Meticulous pre transfusion testing and screening particularly for transfusion transmissible infections (TTI) is required to avoid blood transfusion infections [6].

Bhattacharya P et al observed that in West Bengal, HCV screening test is mandatory started from June 2001 as there was an increasing seroprevalence of HBV about 1.28 to 1.66%, HCV 0.28 -to 0.35%, and HIV 0.23 to 0.35% in blood donors of Kolkata in 2004 to 2005 [7]. In our study we found that 1.78% of HBsAg compared to HIV 0.39% and , HCV 0.25% respectively.

Irshad M and Mollah AH et al said that human beings are the only reservoir of blood-borne viruses like HBV, HCV, and HIV and these infections are major life threatening because of their prolonged viremia and latent or carrier state. They are transmitted parenterally, or through high-

risk sexual behaviors and can cause fatal acute and chronic life-threatening disorders. Blood transfusion is a potentially significant route of transmission of these infections [8, 9].

Acharya SK et al in their study found that in India carrier rate of anti-HCV positivity presents in 1 to 1.5%.(10) In contrast to Acharya SK et al study we observed anti- HCV positivity at lower rate i.e. 0.25%.

Sentinel Surveillance reported that there were 3.9 million HIV- positive people in India and more than 29 000 have AIDS (11).

Kleiman SH et al in their study they mentioned that the burden of these three infections is not negligible, all of them are associated with significant morbidity, mortality, and socioeconomic burden in the community [12].

Wienberger KM et al said that due to limitation in current blood screening practices in developing countries, donation by such individual is a potential threat to blood recipients (13).

Chattopadhyay S et al in their study mentioned that in India, detection of HBV infection among blood donors is carried out by HBsAg screening, while detection of anti-HBc is rarely done. HCV is transmitted primarily through blood exposure. In contrast to HBV, about 20 to 40% of HCV cases are acute and majority of them progress to chronic infection. There is a long term risk of developing cirrhosis and hepatocellular carcinoma is greater in HCV infected individuals than in those infected with HBV. Indian studies indicate that seroprevalence of HCV ranges between 0.4% to 1.09 % [14] In our study we observed lower seroprevalence of HCV infection i.e 0.25%.

Srikrishna A et al in their study reported that an increasing trend of HCV infection with age were seen from studies in India and other countries ,showing that the infection would have been acquired in the last few years due to the use of unsafe needle and contaminated equipment used in health-care related procedure. They found higher HCV prevalence rate of 0.72% in the age group of

18-30 years, possibly implying a higher exposure rate of HCV in younger population group [15].

According study of Srikrishna A et al in our study we also found higher seroprevalence of HCV i.e.0.22% among blood donors between 20 to 40 years age group.

A recent study by Pahuja et al in 2007 revealed alarming high seroprevalence of HIV, anti-HCV, and HBsAg (0.56%, 0.6%, and 2.23%, respectively) among blood donors of a metropolitan city like Delhi. [16] But in our study we observed that seroprevalence of HIV, HCV and HBsAg was on lower side (0.39%,0.25% & 1.78% respectively).

Bhawani Y et al reported that their study was dominated by replacement donors in whom all infections were found to be more prevalent. The size of voluntary donors was smaller and infections slightly less prevalent. The seroprevalence of HIV, HBV, HCV and syphilis among the 8067donors was found to be 0.39%, 1.41%, 0.84% and 0.08% respectively([17] .

Fernandes, H et al in their study mentioned that transfusion of blood and blood products are major life saving procedure and also help innumerable people worldwide but at the same time blood transfusion is one of the important source of transmission of infections to the recipients. In the developing countries the prevalence of TTIs is much higher and quite far from attending a zero risk level at present moment [18].

In our study we found that among blood donors the estimated risk of HCV and HIV infections has significantly reduced compared hepatitis B infection where as no donor were positive for VDRL and malaria parasite.

This study was undertaken because although the seroprevalence of HBsAg is more prevalent as compared to HIV and HCV infections in the community but most of people were not aware about HCV infection Srikrishna A et al in their

study reported that an increasing trend of HCV infection in younger age group.

Chattopadhyay S et al also mentioned in their study that in India, detection of HBV infection among blood donors is routinely carried out by HBsAg screening, while detection of anti-HBc is rarely done and In contrast to HBV, about 20 to 40% of HCV infection are acute and majority of them progress to chronic infection. Also long term risk of developing cirrhosis and hepatocellular carcinoma is greater in HCV infected individuals compared to infected with HBV in Indian studies. And in past mid 1980s AIDS was one of the major transfusion transmitted infection among blood donors which raised the question of blood safety. So We undertaken to know the seroprevalence of HIV and HCV infections among blood donors and also helps in effective control of these transfusion transmissible infections among community.

CONCLUSION:

By this study we conclude that it would be possible to screen a large population of donors for prevalence of HIV, HBV and HCV .There is a long term risk which will continue as long as commercial blood banks remain operational and until appropriate nationwide vaccination programmes and other control measures are established. Motivation and creating awareness among both in rural and urban population about transfusion transmissible infection would lead to an effective control of transfusion transmissible infections.

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