

**Original Article****Seroprevalence of Transfusion Transmitted Infection among Blood Donors in Government Blood Banks of Chhattishgarh: Retrospective 5 Years Study**

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Email: drkishoripanda@gmail.com, Mobile: 08763874020**ABSTRACT**

Background: *Transfusion transmissible infection (TTI) is defined as any infection that is transmissible from person to- person through parenteral administration of blood or blood products. The occurrence of TTIs varies from country to country. So to measure their severity, WHO (World Health Organization) has recommended pre-transfusion blood test for Human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C Virus (HCV) and Syphilis as mandatory. The present study is undertaken to assess the seroprevalence of these infectious markers in blood donors of Chhattishgarh state.*

Materials and Methods: *HIV, HBV, HCV & VDRL tests were done either by rapid kit or by ELISA methods. The prevalence of positive test results were evaluated for 5 years from 2010-11 to 2014-15.*

Results: *The total number of donors were 306,864, comprising of voluntary 238856 (77.83 %) and replacement donors 68008 (22.16%). The overall prevalence of transfusion-transmitted infection was 4681/306864 (1.5 %). The prevalence of HIV, HBV, HCV and VDRL among total blood units collected were 666 (0.21%), 2254 (0.73%), 615 (0.2%) & 1146 (0.36%) respectively. Majority 2254/4681 (48.1 %) of infection was HBV. Seropositivity for HIV, HBV, HCV showed annual decrease, but seropositivity for VDRL increased over time.*

Conclusions: *This study showed increasing percentage of voluntary donors and decreasing seroprevalence of TTIs in Chhattisgarh except for VDRL, which showed increasing seroprevalence. Therefore, strict donor selection, increasing participation of voluntary donors, proper testing of donors blood using standard methods as well as NAT and maintaining good quality control can improve blood safety.*

Keywords: *seroprevalence, transfusion transmitted infections, Chhattisgarh, voluntary donors, HBV).*

INTRODUCTION

Transfusion of blood & its products is important to correct the abnormal haematological values.

One way it is life saving, another way it is a source of vast majority of infections, which includes HIV, HBV, HCV and syphilis. With each

unit of blood there is 1% risk of transmission of infections.^[1] The common diseases transmitted through blood transfusion is hepatitis B, hepatitis C, syphilis & AIDs. Uncommon TTIs include brucellosis, toxoplasmosis, some viral infections like CMV, EBV & Herpes. In the Western countries the transmission rate of HIV, HBV, HCV, Syphilis through blood transfusion have been reported to be very low and is around 1 in 2.5 million, 1 in 0.5 to 1 million, 1 in 2 to 4 million, 6 in a million, respectively.^[2,3]

In order to achieve a low rate of transmission, effective donor screening and proper testing of blood for TTIs should be done. The donor screening strategies include taking the elaborate medical history, performing preliminary clinical examination and screening for infectious markers. Screening tests for these infectious markers include rapid kit test & ELISA test for HIV, HBV, HCV & VDRL.^[4] In spite of following all these measures, transmission of infection can occur, primarily because of the inability of the test to detect the disease in the 'window' period of infection, immunologically variant viruses, immune-silent carriers and inadvertent laboratory testing errors.^[5] Detection of infection during window period can be done by Nucleic acid testing (NAT). But NAT is available in a few centers in India.^[6] Knowing the prevalence of TTIs, among blood donors gives an idea about the epidemiology of these diseases in the community and helpful in formulating strategies for improving the management of a safe blood transfusion. The present study was carried out with the aim to find out the seroprevalence of infectious markers among the blood donors of government blood banks of Chhattisgarh state over a period of 5 years from 2010-11 to 2014-15.

MATERIALS & METHODS

A Retrospective study was conducted by reviewing the records from 2010-11 to 2014-15 at the National AIDS Control Organization (NACO) centre, Raipur, Chhattisgarh. The blood donors who presented to all the Govt blood banks of

Chhattisgarh state and screened for TTIs during the study period were included. Blood donors were selected as per NACO donor selection criteria. A proper history taking regarding risk factors like history of surgery, previous illness, hospitalization, blood transfusion, occupation, high risk behaviour and tattoo marks was collected and thorough medical examination was done. Those donors who do not fulfill the criteria were rejected. Rapid screening tests & ELISA test for HIV, HBV, HCV & VDRL was done as per NACO guidelines. All samples testing positive by ELISA were repeat tested in duplicate using the same ELISA kit and repeat reactive samples were considered as true reactive. Then reactive blood units were discarded as per standard protocols. Seropositivity of different infectious markers were recorded. The data from different Govt blood banks was collected, entered and analyzed. The descriptive statistics were determined in means of percentages.

RESULTS

A total of 306864 apparently healthy adult donors were screened during the study period. Among them voluntary donations occupied majority no.238856 (77.83 %) as compared to replacement donations no. 68008 (22.16%). Voluntary donors were 3.5 times more than the replacement donors and the number of voluntary donations increased annually during the study period. (Fig-1) The overall prevalence of transfusion-transmitted infection was 4481/306864 (1.5 %). The overall prevalence of HIV, HBV, HCV and syphilis among total blood units collected were 666 (0.21%), 2254 (0.73%), 615 (0.2%) & 1146 (0.36%) respectively. (table-1). Majority 2254/4681 (48.1 %) of infection was HBV. Seropositivity of HIV, HBsAg, HCV declined overtime, whereas seropositivity of VDRL increased. (Fig-2)

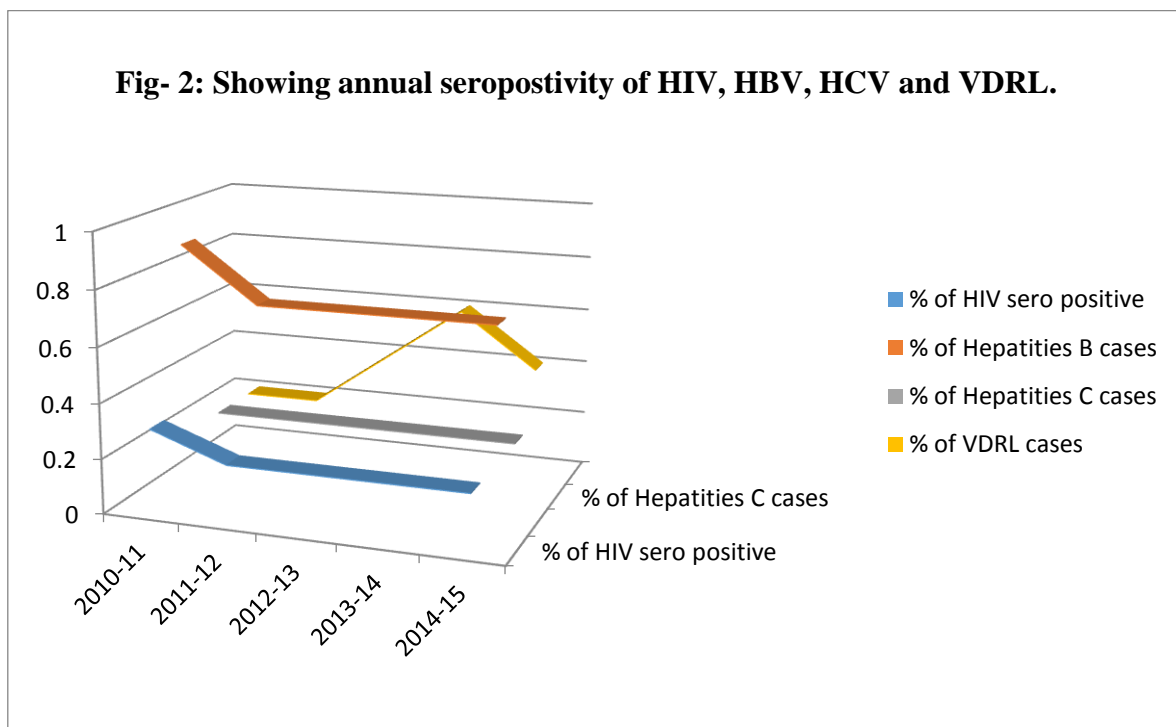
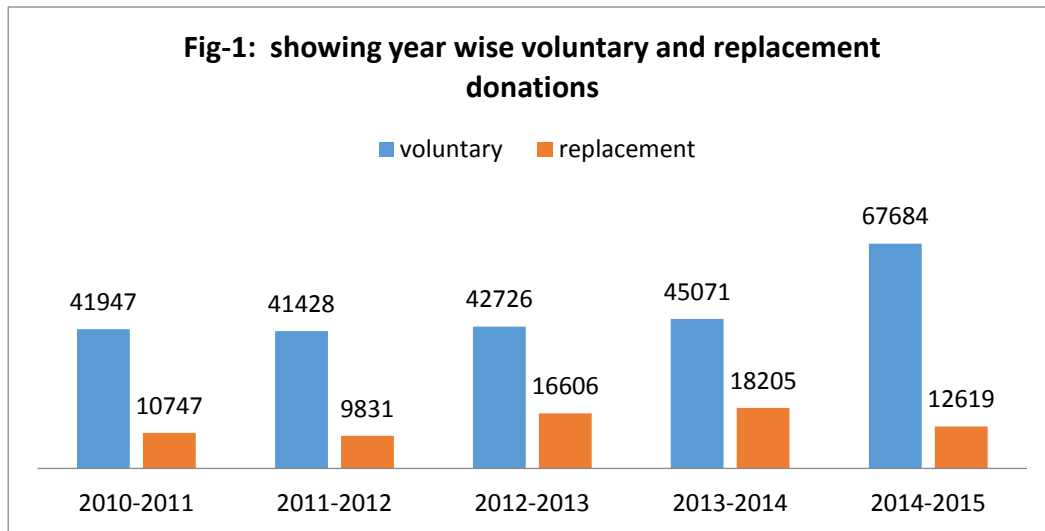


Table-1 Seroprevalences of various infectious markers in blood donors (2011-2015)

Year	total tested	HIV +ve (%)	HBsAg +ve (%)	HCV +ve (%)	VDRL +ve (%)	Total +ve (%)
2010-11	52694	158(0.3%)	474(0.9%)	105(0.2%)	105(0.2%)	842(1.59%)
2011-12	51259	102(0.2%)	359(0.7%)	103(0.2%)	103(0.2%)	667(1.3%)
2012-13	59332	119(0.2%)	416(0.7%)	119(0.2%)	237(0.4%)	891(1.5%)
2013-14	63276	126(0.2%)	443(0.7%)	127(0.2%)	380(0.6%)	1076(1.7%)
2014-15	80303	161(0.2%)	562(0.7%)	161(0.2%)	321(0.4%)	1205(1.5%)
Total	306864	666(0.21%)	2254(0.73%)	615(0.2%)	1146(0.36%)	4681(1.52%)

Table 2 Comparison of seroprevalance % of Infectious markers from various studies in India

	Place	HIV	HBsAg	HCV	Syphilis
North India	Delhi ^[10]	0.56	2.23	0.66	--
South India	Karnataka ^[11]	0.44	1.86	1.02	1.6
West India	Maharashtra ^[12]	0.07	1.09	0.74	0.07
East India	West Bengal ^[13]	0.28	1.46	0.31	0.72
C.G.	Present Study	0.21	0.73	0.2	0.36

DISCUSSION

TTIs are common serious problems of blood transfusion. In developed countries, very low rate of transmission of TTIs has been accomplished by reducing unnecessary transfusions, using only regular voluntary donors, systematic screening of donors blood for infection and availability of NAT.^[7] Glynn et al reported that introduction of NAT in blood donors decreased risk of HCV & HIV significantly.^[8] If these interventions are applied uniformly, the risk of TTIs remains low. Recently blood banks in India are trying these interventions for improved blood safety. But NAT is not available in most parts of India including Chhattisgarh because of unaffordability of the test.^[9]

Seroprevalence of TTIs in this study is compared with other Indian studies, which is given in Table no-2. ^[10, 11, 12, 13] In this study the overall prevalence of TTIs among blood donors over past 5 years was 4481/306864 (1.5 %). This is comparable to other studies in Brunei Darussalam by Teo KS et al. (1.49 %),^[14] in Yemen by Saghir et al. (2.35 %),^[15] and in Kassala, eastern Sudan by Abdallah and Ali et al (3 %).^[16] The NACO has reported an overall prevalence of HIV of 0.36 per cent (2006 estimate) in India.^[2] In the present study, almost similar values have been found. Seroprevalence of HIV in Indian studies reported to range between 0.2-1%.^[17,18] Overall seroprevalence of HIV in our study was 0.21 per cent, which is similar to other studies in India.

World Health Organization has placed India in the intermediate zone (2-7% prevalence rates) of prevalence of hepatitis B.^[19] Majority of infections in our study was HBV. Overall seroprevalence of HBV in our blood donors was 0.73 per cent. Prevalence of HBV in Indian studies range between 1.86 to 4%.^[20,21] Seroprevalence of HBV in Pakistan^[22,23,24] and Bangladesh^[25] has been reported as (range:1.55-8.4%) and (range:1.5 -2.96%). Prevalence of HCV in Indian studies range between 0.4-1.09%. Studies done in Pakistan (Bangladesh,^[23,24] and Bangladesh^[25] reported HCV prevalence to range

between (0.07-4.9%) and (0.13-4.3%). Overall seroprevalence of HCV in our blood donors was 0.2 per cent. The lower prevalence of HBV & HCV in our study may be due to lower sensitivity of assay methods or due to a particular geographical distribution or declining rate of positivity in healthy population.

Syphilis though is a sexually transmitted infection, is also transmitted via blood and blood products. Overall VDRL reactivity in our study is 0.36%, which is comparable to other Indian studies. However, increasing seroprevalence of VDRL was seen in this study. So it is essential to exclude high risk behaviour donors. The current study was based on retrospective review of monthly summary record at NACO centre, Raipur, Chhattisgarh, which is a limitation as age, gender and other details are not included. The non-availability of NAT for detection of HIV, HBV and HCV is also another limitation. Therefore larger studies including all demographic details are needed.

CONCLUSIONS

This study showed increasing percentage of voluntary donors and relatively low seroprevalence of TTIs in Chhattisgarh. Decreasing seropositivity for HIV, HBV, HCV and increasing seropositivity for VDRL was seen. Therefore, strict donor selection, increasing participation of voluntary donors, proper testing of donors blood using standard methods as well as NAT to overcome the limitations of window period and maintaining good quality control can improve blood safety.

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Conflict of interest - Nil

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