

SERO-PREVALENCE AND TRENDS OF TRANSFUSION TRANSMITTED INFECTIONS AMONG 706853 BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN JAIPUR

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ABSTRACT

Background: Transfusion Transmitted Infections (TTI) poses a great threat for the health and safety of patients. In order to provide safe and adequate quantity of blood and blood components, Govt. Of India made pretransfusion screening and testing mandatory in the National Blood Policy (2002). AIM : The aim of this study is to assess the trends and seroprevalence of TTI's among voluntary and replacement donors in the north western region of Rajasthan. **MATERIAL & METHOD:** A retrospective review of donor's record covering the period between 2002 to 2015 is carried out at Blood Bank, SMS Hospital, Jaipur. All samples were screened for HIV, HBV, HCV, Syphilis & Malarial parasite. Method used is ELISA (for HIV, HBV, & HCV; RPR for Syphilis and Random peripheral blood film examination/ rapid card test for malaria). **RESULTS:** Prevalence of TTI in total donors is 3.02%. Prevalence of Hep B (1.83%) was highest followed by Syphilis (0.75%), HCV (0.28%), HIV (0.15%) and Malaria (0.01%). **CONCLUSION:** It is important to analyze the incidence, prevalence and causes of TTI in our region & compare them with national & international level. It is well within the reach to reduce the incidence of TTI's in Indian scenario with the implementation of strict donor criteria and use of sensitive screening tests.

KEY WORDS: Transfusion Transmitted Infection, Blood Transfusion, Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus, Syphilis, Malaria

INTRODUCTION:

Blood Transfusion Services is an essential part of the National Health Service. There is no substitute for Blood and its components. Blood transfusion is lifesaving in some situations as well as it has potential life threatening hazards. Transfusion of unscreened blood and its components significantly exposes the patient to potential risk of transmitting infections like HIV, Hepatitis, Syphilis and Malaria etc. and increases the morbidity and mortality.

Even with strict strategies and policies, transmission of disease still occurs because of inability of testing

methods to detect the infection in 'window period', immunologically variant viruses, immune silent carriers, limitations of funds and trained personnel, and unforeseen laboratory testing errors. Concealment of medical history by donors, professional donors etc. is a great challenge to safe blood supply.

The aim of our study is to find out seroprevalence of transfusion transmitted infections in replacement and voluntary donors in north western region of Rajasthan.

MATERIAL AND METHODS:

A retrospective study is done in Blood Bank SMS Medical College and Hospital Jaipur. Records of total 706853 donors were analysed for the study. The Voluntary donations were primarily obtained from blood donation camps organised by the NGO's and societies. Replacement donors include family members, friends of the ailing patients and close relatives. Care was taken to avoid paid/professional donors by taking medical history and clinical examination. Basic information of donors including age, sex, occupation, medication, previous donations etc. were obtained. Donors were selected as per inclusion and exclusion criterion as follows:

Inclusion criteria

1. Age: >18 to <60 yrs.
2. Weight : >50kg.
3. Vitals (BP, Pulse, Temp), General physical examination : Within normal limit
4. Hb > 12.5gm/dl
5. At least 3 months since last whole blood donation
6. Adequate venous access

Exclusion criteria

1. Age <18 and >60 yrs.
2. Weight <50 kg

3. Hb < 12.5 gm/dl
4. Donor must not have taken aspirin or any antiplatelet drug within 48 hrs.
5. History of any medical disorder, comorbidities.
6. Those not willing to give consent

All samples were screened for human immunodeficiency virus (ELISA, 4th Generation SD HIV1/2 ELISA 3.0, Bio Standard Diagnostic Pvt Ltd), hepatitis B surface antigen (ELISA, Microscreen, Span Diagnostic Ltd), Hepatitis C virus (ELISA, Microlisa- J.Mitra & Co.Pvt Ltd), Venereal Disease research laboratory (VDRL) [RPR-AGAPPE Diagnostics] and Malaria by random peripheral blood film testing till 2013 and by rapid card test from 2014 onwards. Tests were performed as per instructions given by manufacturer. Before labelling them seropositive, all the reactive samples were retested and discarded as per the guidelines. The affected donors are informed through proper channels and are properly counselled. Data collection and analysis was done by compiling data on excel sheet and simple statistics was used to find out the result.

RESULT:

A total of 706853 donors were enlisted in this study from 2002 to 2015. Out Of these 558172 were replacement donors and 148781 were voluntary donors. Total blood units supplied during this period were 851577 and total outdoor camps were 1823.

Figure : 1

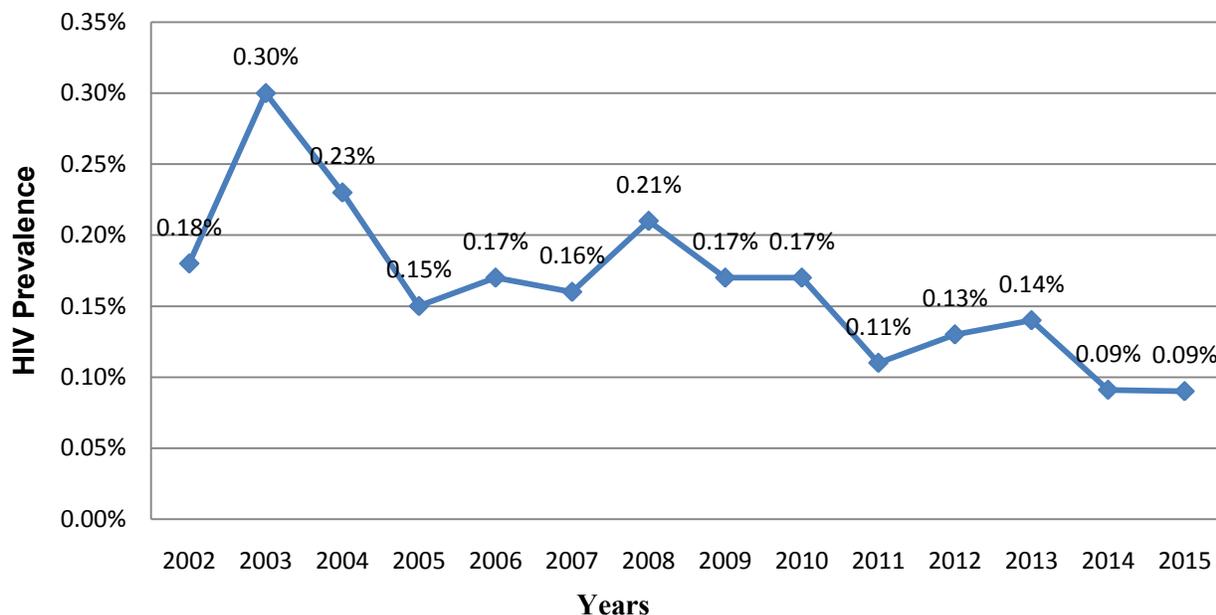


Table 1 : The trends over prevalence of HBV, HCV, HIV and Syphilis are shown:

Year	Total Donors	HIV	HBsAg	HCV	VDRL reactivity	MP	TTI prevalence
2002	37272	70(0.18%)	915(2.45%)	64(0.17%)	523(1.40%)	0	4.21%
2003	40725	124(0.30%)	924(2.26%)	185(0.45%)	406(0.99%)	0	4.02%
2004	42789	99(0.23%)	904(2.11%)	282(0.66%)	550(1.28%)	0	4.28%
2005	43803	66(0.15%)	957(2.18%)	91(0.21%)	750(1.71%)	0	4.25%
2006	48047	86(0.17%)	1044(2.17%)	84(0.17%)	634(1.31%)	0	3.84%
2007	45507	74(0.16%)	978(2.14%)	78(0.17%)	357(0.78%)	0	3.26%
2008	49084	103(0.21%)	1031(2.10%)	105(0.21%)	425(0.86%)	0	3.39%
2009	50878	87(0.17%)	962(1.89%)	82(0.16%)	389(0.76%)	0	2.98%
2010	48460	84(0.17%)	873(1.80%)	125(0.26%)	427(0.88%)	0	3.11%
2011	58277	63(0.11%)	822(1.41%)	97(0.16%)	316(0.54%)	0	2.26%
2012	59197	79(0.13%)	937(1.58%)	65(0.11%)	228(0.38%)	0	2.21%
2013	57128	79(0.14%)	901(1.58%)	124(0.22%)	246(0.43%)	0	2.37%
2014	61432	56(0.09%)	865(1.41%)	246(0.40%)	226(0.36%)	8(0.01%)	2.27%
2015	64254	60(0.09%)	850(1.32%)	92(0.14%)	157(0.24%)	6(0.01%)	1.8%

Overall Prevalence of: HIV-0.15%, HBV-1.83%, HCV-0.28%, Syphilis-0.75%, Malaria-0.01%, Prevalence of TTI in total donors is 3.02%.

Figure : 2

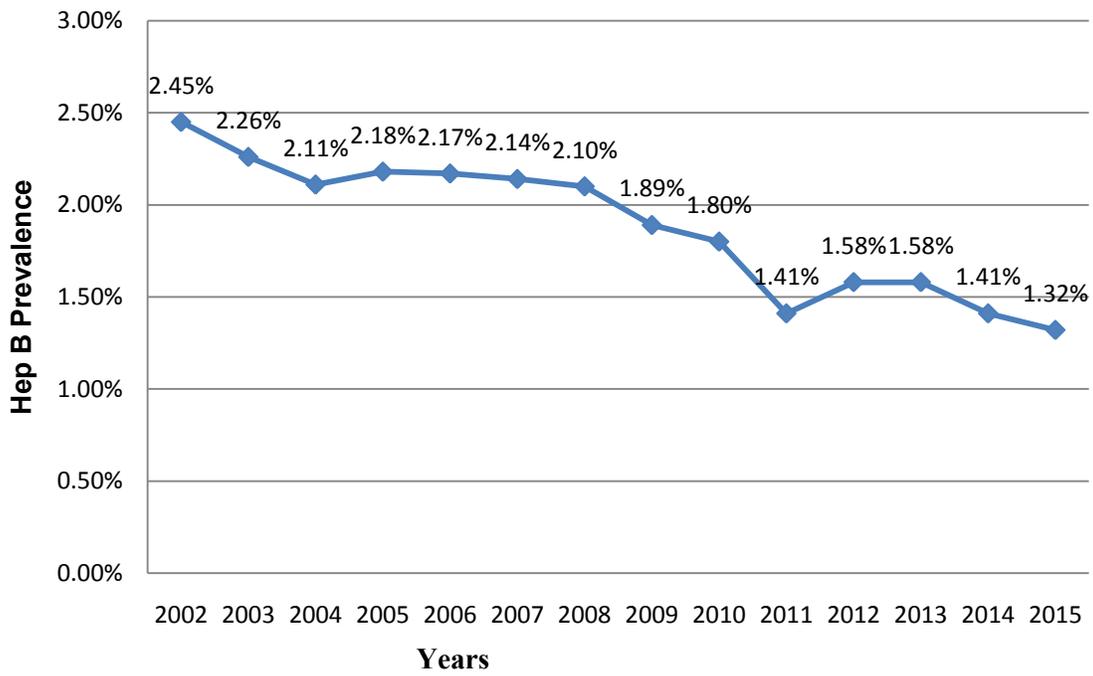


Figure : 3

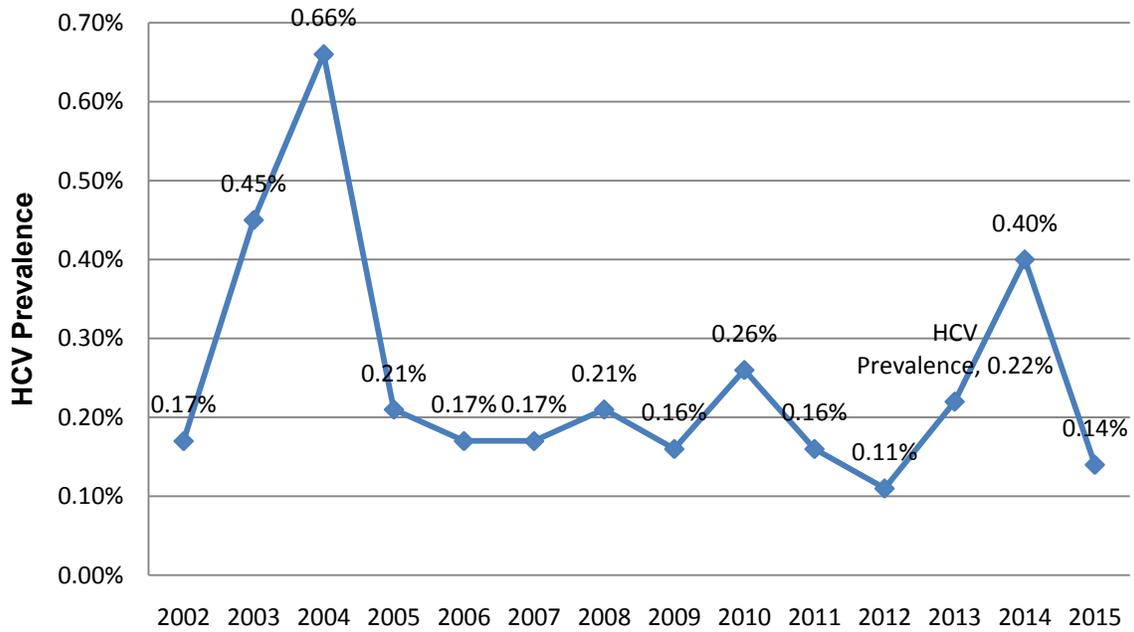


Figure : 4

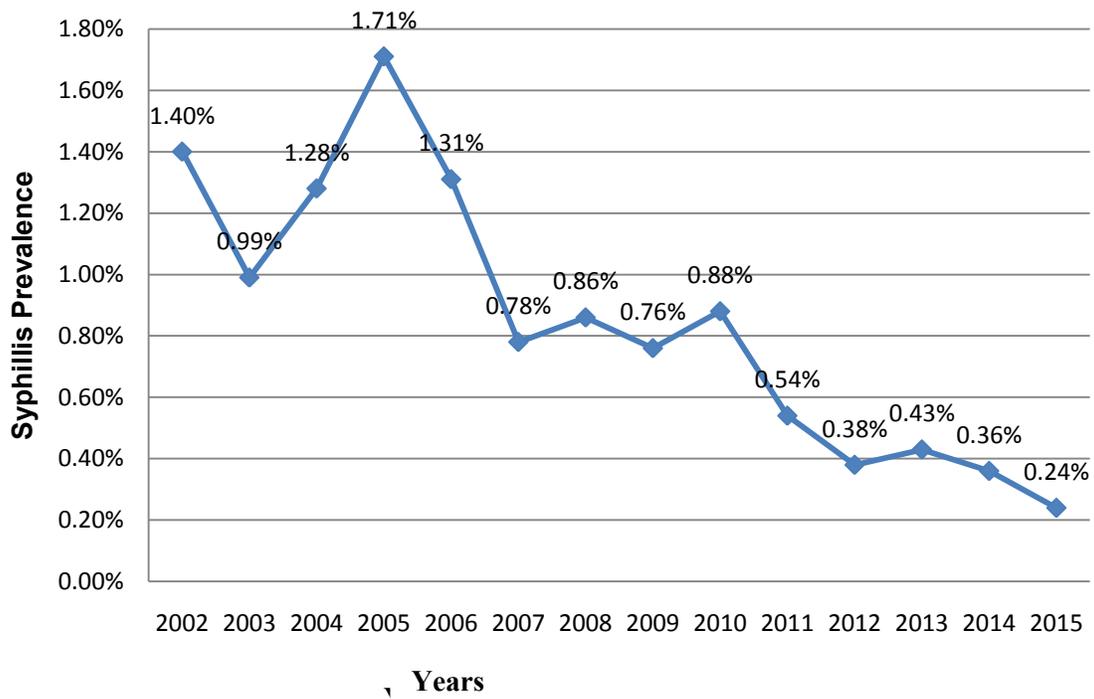
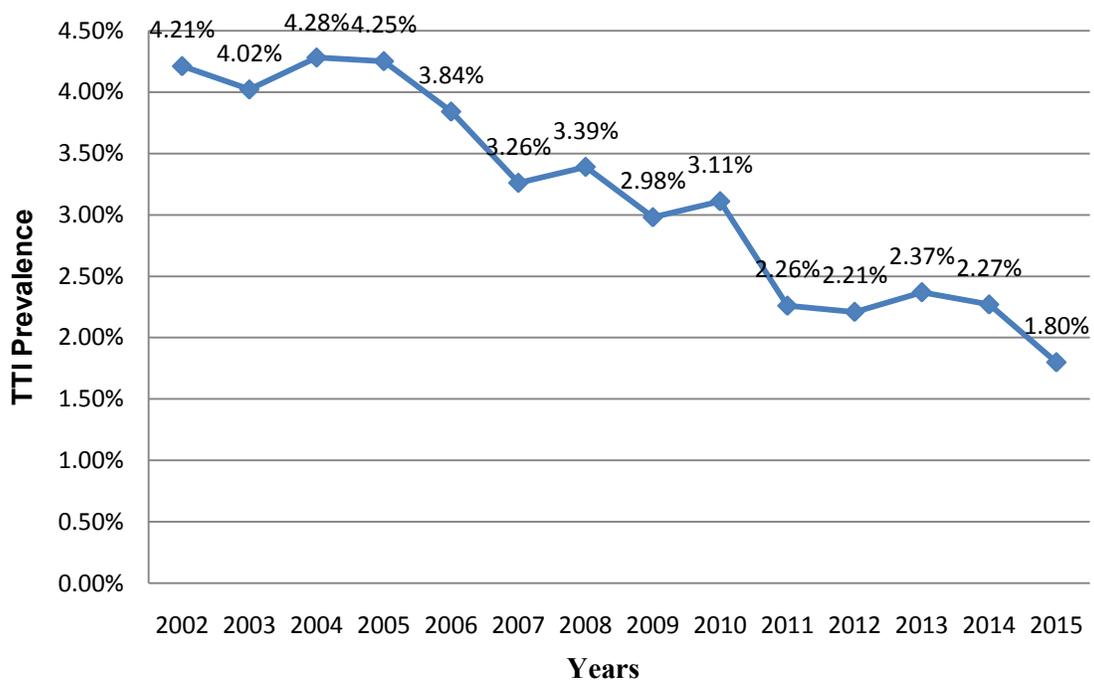
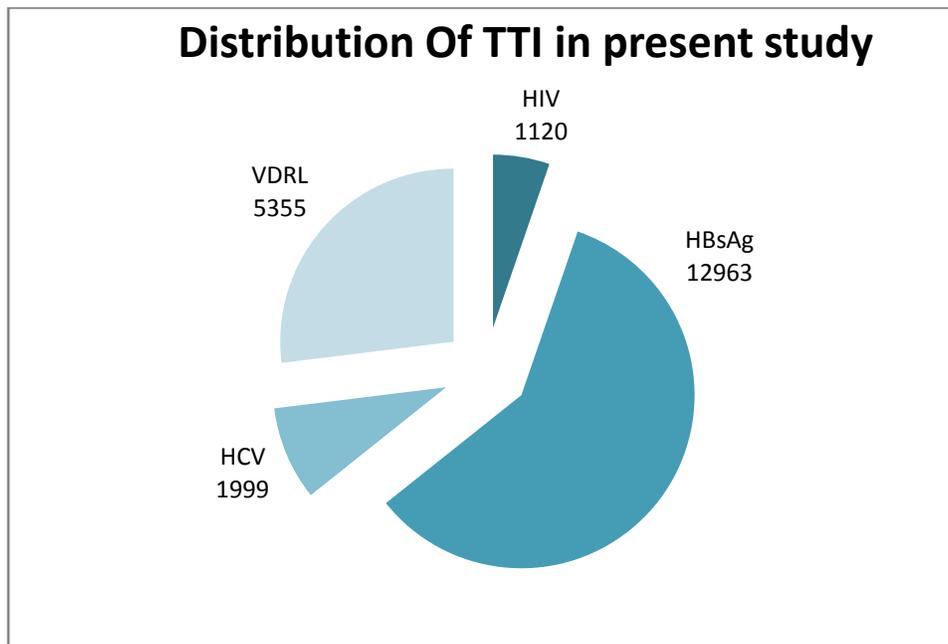


Figure : 5





DISCUSSION:

In this study we found that voluntary donors (VD) constituted 20% while replacement donors (RD) were 80%. This is comparable to the done by Singh et al (4) (82.4%), Kakkar et al (94.7%), Singh et al (84.43%) (2), Pahuja et al (99.48%) and Arora et al (68.6%). It shows that RD continues to be the largest group blood donors in India.

Past Indian studies showing prevalence rates: (4, 6-13)

HIV (0.51-3.87%); HBV (1.2-3.5%); HCV (0.12-4%), Syphilis (0.3-0.82%)

Our findings:

HIV (0.15%); HBV (1.83%); HCV (0.28%); Syphilis (0.75 %); Malaria (0.01%)

The TTI prevalence rates in different parts of India was studied and it was observed that prevalence of HIV and HCV was lowest in our study i.e 0.18 % and 0.25 % in comparison to study done by other authors (1,3,7,11,14,15).

This survey gives the idea about the epidemiology of these diseases in community and also helps in assessing the safety of blood products.

As per Indian National AIDS Control Organization (2011-2012) India has the third largest number of people living with HIV/AIDS. The adult HIV prevalence at national level has showed steady decline from 0.41% in 2000 through 0.36% in 2006 to 0.31% in 2009. Rajasthan shows increase from 0.12% to 0.19%. The states of Bihar, Orrisa, West Bengal, Rajasthan, Uttar Pradesh, Gujrat and Madhya Pradesh together account for 41% of new infections. (National AIDS Control Programme Phase III March 2012).

WHO placed India in the intermediate zone in the prevalence of Hepatitis B (2-7%). Prevalence of HbsAg in our blood donors is 1.83% comparable to the study done by Chandra et al, and Srikrishna et al. On the other hand the prevalence of HBV is lower in Western Europe and United States (0.1-0.5%) and reported to be higher, 5-15% in China and South East Asia (15).

The wide difference in prevalence of HCV might be due to different testing methods having different specificities n sensitivities. Our prevalence rate of 0.28% is in accordance with that of Bhattacharya et al (0.31%). Internationally, various studies have recorded prevalence rate of 0.42-1.2% (10).

VDRL reactivity in our study is 0.75% comparatively low when compared to 1.6% observed by SriKrishna et al (7) and 2.6% noted by Singh et al (2). Studies done by Gupta et al (14) Otuonye et al (16) and Patil et al (17) observed a definite correlation between HIV positivity and Syphilis. No such correlation was observed in our study.

In our study the prevalence of TTI shows a decreasing trend from 4.2% in 2002 to 1.8% 2015. This could be attributed to the implications of strict donation guidelines, availability of more sensitive screening methods and increasing awareness among the general population.

With the availability of techniques such as Nucleic Acid Amplification (NAT), the risk of TTI has been decreased to a major extent in western countries. But in countries like India, where cost effectiveness is a major hindrance, NAT proves to be of poor value.

CONCLUSION:

Blood safety is vital for the prevention and control of transfusion transmitted infections. It is well within the reach to reduce the incidence of TTI's in Indian scenario with the implementation of strict donor criteria and use of sensitive screening tests. Since most of the need of blood is fulfilled by replacement donors, great efforts are required to create awareness among people to help narrow the gap between the demand and supply of blood. This can be ensured by educating the general population about the benefits of donation, clearing the myths associated, advertising the ever increasing demand and assuring a felicitous environment.

Though the risks of infections associated with blood transfusions are declining, a lot is still to be done to improve access and accountability of the health services. Achievements of these goals are only possible through greater awareness, motivation to participate and supplying the laboratories with advanced and affordable technologies.

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