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COMPARISON OF SEROPOSITIVITY OF HIV, HBV, HCV AND SYPHILIS AND MALARIA IN REPLACEMENT AND VOLUNTARY BLOOD DONORS IN WESTERN INDIA

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ABSTRACT

Objective: This study was conducted to evaluate the seroprevalence of HIV, HBV, HCV, and Syphilis and Malaria among blood donors. The data generated will help the clinicians for judicious use of blood as well as awareness regarding the Transfusion transmitted infections. **Research Design Methods**: A total of 46,224 blood donors were screened during a period from April 2008 to October 2012, at blood bank, S.R.G. Hospital and Medical College Jhalawar - District, Rajasthan State. **Results**: Among these 22905 (49.55%) were voluntary donors and 25219 (54.58%) were replacement donors .Seropositivity for Human Immunodeficiency Virus (HIV) was 0.034%, Hepatitis B Virus (HBV) was 1.57%, Hepatitis C Virus (HCV) was 0.04%, Rapid plasma Reagin method (RPR) for syphilis was 0.019% and Malaria was 0.017% respectively. **Conclusions**: Infections are slightly more common among replacement donors compared to voluntary donors. There was a gradual decrease of Transfusion Transmitted Infections (TTIs) in blood donors over the years by reason of following of stringent blood donor selection criteria.

Keywords: Transfusion Transmitted Infections (TTI), Seroprevalence, Human Immunodeficiency Virus (HIV), Hepatitis C Virus (HCV), Hepatitis B Virus (HBV).

INTRODUCTION

Blood transfusion is the biggest treatment modality to save lives of thalassemic children, DIC and Post Partum Hemorrhage women, surgeries, accidents etc. There is a 1% chance of Transfusion Transmitted Infections (TTIs) with each unit of transfusion. TTIs can exist as asymptomatic diseases in the host[1].So all donors must be screened for high risk behavior related diseases[2].

Unsafe blood transfusion pays high cost to society. Morbidity and mortality resulting from transfusion of infected blood have far – reaching consequences, not only for recipients themselves, but also for their families, communities and society[3].

The diseases transmitted by blood are HIV, Hepatitis B and C, Syphilis, Malaria and infrequently Cytomegalovirus, Epstein Bar Virus, Parvo virus B19, Brucellosis etc. Prevention of TTIs presents one of the greatest challenges of transfusion medicine[4].

As per guidelines of the ministry of health and family welfare (Government of India) under the Drug and cosmetic Act 1945, all blood donors are be to screened against five major infections HIV 1 and 2, HBsAg, HCV, syphilis and Malaria. Even with strict donor screening and testing practices, safe blood free from TTIs remain an intricate goal. Although technological developments have led to improve the more sensitive methods to detect markers of TTIs, the

problems of false – negative results because of 'window period', asymptomatic carriers, high genetic variability in viral strains and technical mistakes stay behind [6].

Hepatitis B is one of the most common diseases transmitted by blood and infected two million people worldwide including an estimated 400 million chronically infected cases. Individuals with chronic infection have a high risk of developing liver cirrhosis and hepatocellular carcinoma[7].

The present study was undertaken to assess prevalence and trends of TTIs among voluntary and replacement blood donors in this part of the country as prevalence varies in different geographic areas of the country.

MATERIAL AND METHOD

Present study was carried out in blood bank of S.R.G. Hospital and Jhalawar medical college, Jhalawar, Rajasthan. 46224 donors were analyzed for prevalence of TTIs from April 2008 to October 2012. These were 22905(49.55%) voluntary donors and 25219(54.58%) were replacement donors. This study included replacement donors and replacement donors. The replacement donors defined as who donated for their patients and were close relatives, family members or friends of the recipient. We arranged Different outdoor camps to obtain the voluntary donations. At voluntary places care was taken to remove professional and paid donors by taking Proper history and clinical examination.

A detailed pre – donation questionnaire was included in donor registration foresee.

Information regarding history of surgery, hospitalization, blood transfusion, occupation, high – risk behavior and tattoo marks etc. were collected. All samples were screened for HIV (Elisa and Rapid test) [8], Hepatitis B surface antigen (Elisa, Hepalisa – J. Mitra and co. and Rapid test) [9], Hepatitis C virus (Elisa Microlisa – J. Mitra and co. and Rapid Test) [10], RPR-Rapid plasma Reagin method[11] and Malaria- by Thick smear examination. Tests were performed according to the manufacturer's instructions of commercially available kit in blood bank in department of Pathology, Jhalawar Medical College and S.R.G. Hospital. The donated blood was discarded whenever the pilot donor sample was found positive for any TTIs.

RESULTS

46224 blood donors were screened in last four years. The numbers of donations have increased from 8209 in 2008 to 12396 in 2011 (Table-1). Table no. – 2 is showing the result of seropositive samples for HIV, HBV, HCV, VDRL and Malaria. Seropositivity was observed more in replacement donors than in voluntary donors.

The year wise comparative study and present study also have shown in table 1 and 2 of seropositivity by replacement and voluntary donors.

DISCUSSION

TTIs continue to be a threat to safe transfusion practices. With every one unit of blood, there is a 1% possibility of transfusion – associated risk including TTIs[12]. Professional donors and donors with high risk behavior such as drug addict, homosexuals and prostitutes constitute the major risk segment.

In our study, voluntary donations were about 49.55% of the total. In Northern India, the voluntary donor rate vary from 9.1% to 52.33%.[13] and the National AIDS Control Organization (NACO) suggests that in 2007, voluntary donations in India were about 55%. We encountered a steady rise in voluntary donors from 6.53% in 2008 to about 72.29% in 2011, a trend noted in other studies too[14]. Although there are many studies on the prevalence of TTIs in blood donors, data regarding comparison between seropositivity of Voluntary and Replacement blood donation is sparse.

The HIV Seroprevalence in Indian scenario has been reported between 0.2% to 1%[15].The

seropositivity of HIV has increased from 0.012% to 0.08% in last four years and more in replacement donors. Majority of donors were truck – drivers (high risk behavior group), one was schoolteacher and a donor was student. More people migrating from rural to urban area may be a cause of increase numbers in HIV Seropositivity.

Studies done by Chandra et al[16] (2001-2006) at Lucknow, U.P. shows HIV positivity of 0.01% which is similar to our studies. It is also clear from national data that higher incidence of HIV was found in Maharashtra, Chennai and south India.

The prevalence of HIV in our study has not increased possibly because of increase in the percentage of voluntary donations which has increased from 6.53% to 72.29% in recent past.

Different studies from India have shown Hepatitis B seropositivity rate from 2% to 8% in different geographical areas. HBV is a major source of transfusion transmitted hepatitis and is associated with career rate, chronic liver diseases and hepatocellular carcinoma even. In present study there is a dramatic difference in seropositivity among voluntary and replacement donors. In replacement donors HBV is around 3.0%; while in voluntary donors it is less of around 0.68%. The prevalence was similar to study done by Chaudhary et al[17] Lucknow.

Jhalawar district is dived into 6 blocks. Among these families of Khanpur block show high Prevalence of HBV cases ; the reason may be the reuse of needles by quacks and compounder's malpractices, social practices of tattoos, as this district is socioeconomically deprived and literacy rate is also low here.

Prevalence of HCV is comparatively less (0.01% to 0.06%) in our study compared to other studies though it was comparatively higher among replacement donors (0.26%). In one case in 2011 we found a donor co-infected by HBV and HCV.

Transfusion transmitted syphilis is not a main peril of modern blood transfusion therapy, transfusion transmitted syphilis rarely have been recognized. The screening of syphilis commonly done by the rapid plasma regain test; it is not the syphilis transmission that is worrisome being a sexually transmitted disease it is presents point towards donor's Indulgence in "high risk" behavior and higher risk of exposure to infections like HIV and hepatitis (Ness, 1991). The risk of TTI of HBV, HCV and HIV could be curtailed by foreword of few more sensitive and specific tests for screening of donor's sample. Preface of nucleic acid amplification testing (NAT) for HCV, HIV, anti hepatitis B core antigen (HBcAg) and IgM for hepatitis B infection is recommended to identify the infections during window period.

CONCLUSION

To conclude, with the implementation of firm selection norm of donor as per the guide lines laid down for the blood banks in the gazette notification by the Government of India and use of sensitive and specific laboratory screening tests, it is achievable to decrease the occurrence of seropositivity of transfusion transmitted infections and improve the blood product safety.

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Table:-1 Trends in voluntary and Replacement Blood Donation

Year	Total accepted donors	Voluntary donors		Replacement donors	
	n	N	(%)	n	(%)
2008	8209	583	6.53	7626	92.89
2009	9108	2865	31.45	6243	68.54
2010	9300	5702	61.31	3598	38.68
2011	12396	8962	72.29	3434	27.72
2012 (Jan to Oct.)	7211	4893	67.85	2318	32.15
Total	46224	22905	49.55	25219	54.58

Table:-2 Comparison of seropositivity between voluntary and replacement donors

Year	HIV		HBV		HCV		RPR		Malaria	
	Voluntary%	Replacement %	Voluntary %	Replacement %	Voluntary %	Replacement %	Voluntary %	Replacement %	Voluntary %	Replacement %
2008	0.012	0.02	0.6	3.6	0.03	0.06	0.4	0.5	0.01	0.02
2009	0.02	0.06	0.8	1.9	0.01	0.01	0.13	0.08	0.01	0.01
2010	0.02	0.07	0.28	1.69	0.02	0.01	0.01	0.02	0.01	0.03
2011	0.01	0.08	0.29	2.56	0.02	0.26	0.1	0.72	0.02	0.03
2012	0.02	0.03	0.72	3.3	0.01	0.02	0.01	0.02	0.01	0.02