



The Prevalence of the Transfusion Transmissible Infections (TTI) among Donors Studied in a Tertiary Level Hospital in Bangladesh

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Abstract

Background: Transfusion transmissible infections can be a risk for health care professionals, according to World Health Organization (WHO) about 3 million workers are getting exposed to these kinds of infections each year. The overall prevalence of transfusion-transmitted infections ranges between 2.79% and 18.7%. **Objectives:** This study aimed to identify the prevalence of transfusion transmissible infections among prospective donors. **Materials and Methods:** This prospective analytic study was conducted among 3963 donors at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Detection of HBsAg, Anti-HCV, Anti-HIV, Anti-Treponema, and Anti-Malaria was done by Immunochromatographic test (ICT), Syphilis Fast latex agglutination, RDT test, and reconfirmed by ELISA. **Results:** Among 3963 donors the transfusion transmissible infection's seroprevalence was 47(1.18%). The prevalence of HBV, HCV, HIV, Syphilis and Malaria were found to be 30(0.76%), 09(0.23%), 03(0.07%), 04(0.10%) and 01(0.02%) respectively. **Conclusion:** There should be a strict guideline in donor selection to avoid TTI. Implementation of a more sensitive testing methodology should help to detect infection in donors accurately, even during the window period, which may reduce TTI. **Keywords:** Transfusion transmissible infections, HBV, HCV, HIV, Syphilis, and Malaria.

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Introduction

Blood donor's pre-donation screening to detect Transfusion Transmissible Infections (TTI) is the procedure through which a prospective donor is tested for the presence of one or more of the TTI agents using a single rapid or quick method, and donation could be deferred if the test is positive for any of the TTI markers ^[1].

The most important agents causing transfusion-transmitted infections (TTIs) are Hepatitis B virus (HBV), hepatitis C virus (HCV), Human immune deficiency virus (HIV), and syphilis and they constitute huge health care burdens over the globe. Because of their latent nature before clinical presentation, their incidence rates are difficult to calculate. Every blood transfusion, therefore, carries a significant risk for transmissible diseases ^[1 2]. Despite stringent donor screening and testing practices, the problems of 'window period', false-negative results, the prevalence of asymptomatic carriers, genetic variability in the viral strains, and technical errors remain ^[3]. Transfusion transmissible infections can be a risk for health care professionals, according to World Health Organization (WHO) about 3 million workers are getting exposed to this kind of infection each year. ^[4] The overall prevalence of transfusion-transmitted infections ranges between 2.79% and 18.7% ^[5]. This study aimed to identify the prevalence of transfusion transmissible infections among prospective donors.

Materials and methods

A prospective observational study was conducted among 3963 donors at the Department of Transfusion Medicine at Bangabandhu Sheikh Mujib University (BSMMU), Dhaka, Bangladesh from January 2012 to December 2012. The age distribution of donors was 18 to 55 years with fulfilling the blood donor's criteria, as well as donors, were divided into two groups: volunteer and patient's relative. Informed written consent was taken from all respondents. Blood samples were collected in a pre-labelled glass test tube during collection then blood was centrifuged to separate serum. Detection of HBsAg, Anti-HCV, Anti-HIV, Anti-Treponema, and Anti-Malaria was done by Immunochromatographic test (ICT), Syphilis Fast latex agglutination, RDT test} and reconfirmed by ELISA. All tests were performed according to the instruction of the reagent manufacturer. Test results were recorded after the completion of laboratory procedures.

Results

A total of 3963 blood donors were analyzed. Among them, 2153 donors were volunteers whereas 1810 donors were patient's relatives. Out of this 3963 donors, male donors were 3087(77.89%) by contrast female donors were only 876(22.10%), with a ratio of 22:1. Male donors were by far the highest in number in our study (Table-1).

There were 44 seropositive male donors and three seropositive female donors (Table-2). Among 3963 donors the transfusion transmissible infection's seroprevalence was 47(1.18%). The prevalence of HBV, HCV, HIV, Syphilis and Malaria were found to be 30(0.76%), 09(0.23%), 03(0.07%), 04(0.10%) and 01(0.02%) respectively (Table-2). In this study, the highest

prevalence was HBV, followed by HCV. By contrast, the least prevalence was Malaria and HIV whereas Syphilis was slightly higher than HIV (Table-2). In all five diseases, detected infections were significantly higher in the case of volunteer donors than relative donors. Similarly, the infection rate was remarkably higher in male donors than female donors.

Table 1: Socio-demographic data of the study population (n=3963)

Variables		Volunteer (2153)		Patient's Relatives (1810)	
		Male (1962)	Female (191)	Male (1125)	Female (685)
Age	18-30	1613(40.70%)	86(4.81%)	518(13.07%)	77(1.94%)
	31-43	304(7.67%)	05(0.13%)	307(7.75%)	597(15.06%)
	44-55	45(1.13%)	00	300(7.57%)	11(0.28%)
Occupation	Student	1688(42.59%)	180(4.54%)	1011(25.51%)	164(4.14%)
	Service holder	255(6.43%)	09(0.23%)	96(2.42%)	521(13.14%)
	Business	19(0.48%)	00	18(0.45%)	00
	No Job /Homemaker	00	02(0.05%)	00	00
Marital Status	Married	245(6.18%)	55(1.39%)	460(11.61%)	633(15.97%)
	Unmarried	1708(43.09%)	136(3.43%)	665(16.78%)	52(1.31%)
HBV Immunization History	Immunize	1387(34.99%)	114(2.88%)	749(18.89%)	456(11.51%)
	Non immunize	575(14.51%)	77(1.94%)	376(9.49%)	229(5.78%)

A total of 3,963 blood donors were analyzed. Among them, 2,153 donors were volunteers whereas 1,810 donors were patients' relatives. Out of these 3,963 donors, males were 3,087(77.89%) by contrast females were only 876(22.10%), with a ratio of 22:1. Male donors were by far the highest in number in our study (Table-1).

Among the volunteer male group, the highest number of donors, 1,613(40.70%), were within the age group between 18 and 30 years, and the number of donors reduced with age. Also, the volunteer female number was noted to be more at the same age group with 86(4.81%). A similar pattern was found in the case of male Patient's Relatives. However, in the case of female Patient's Relatives donor was significantly high between age 31 and 43 years with 597(15.06%) in comparison to other age groups.

For the volunteer donors, majority of the male and female donors were students with 1,688(42.59%) and 180(4.54%) respectively, whereas although most of the male Patient's Relatives donor was male however the highest number of female Patient's Relatives were service holder with 521(13.14%). Homemaker's participation was quite limited in blood donation events.

The number of participants of unmarried people was remarkably noticeable in both volunteer male and female, and in male patients' relative with 1708(43.09%),136(3.43%), and 665(16.78%) respectively. In contrast, the married donor of the patient's relative was remarkably more with 633(15.97%) than the unmarried female relative's.

In both groups, HBV Immunized persons were more in both male and female than non-immunization.

Table 2: Distribution of seropositive cases (N= 47)

Diseases	Volunteer Donors		Relative Donors		Total Number	Percentage (%)
	Male	Female	Male	Female		
HBV	24	01	04	01	30	0.76
HCV	07	00	02	00	09	0.23
HIV	02	01	00	00	03	0.07
Syphilis	03	00	01	00	04	0.10
Malaria	00	00	01	00	01	0.02

Discussion

Blood is a nonnegotiable therapeutic necessity that still has no genuine substitution. Blood transfusion saves many lives in cases of emergency and is of more concern to transfuse safe blood to avoid further complications mainly TTI's ^[6].

It is important to understand the magnitude of disease transmission in the community for its control and prevention ^[7], thus the assessment and study of TTI' seroprevalence is crucial.

In this study male blood donor was noticeably higher with 3087(77.89%) whereas it was only 876(22.10%) for female donors. It was probably due to lack of proper awareness ^[8] and education ^[9, 10] among the female generation they could also participate in this kind of donation without hampering daily life activities. We noticed that donations from relatives were far safer than volunteers. It may be possible as volunteers donate blood more frequently than the relatives so there is a chance to be infected during any donation events ^[11,12] where safety measures were not maintained properly during needle insertion ^[13,14] or accidentally.

In this study, the highest infection rate was HBV with 30(0.76%). WHO estimates that in 2015, 257million people were living with chronic hepatitis B infection. The African and Western Pacific regions accounted for 68% ^[15,16]. There were 1.34milliondeaths due to the hepatitis virus ^[17, 18]. HCV was in the second-highest position with 09(0.23%) followed by Syphilis with 04(0.10%) in this study. As HCV is possible to be transmitted by needle prick so there has quite a possibility to transmit this virus if a sterile syringe is not used during the collection of blood. Malaria was by far the least founded infection with 01(0.02%) which may be due to strict regulation and control of mosquitoes by the Bangladesh Government both in cities and hilly areas.

Conclusion

If the donor is a relative of the patient, would be safer than other sources of blood. So we should encourage the donation of blood from close relatives. There should be a strict guideline in donor selection to avoid TTI, and encouragement of female donors would be an important source of

transfusions. Implementation of a more sensitive testing methodology should help to detect infection in donors accurately, even during the window period, which may reduce TTI.

Declaration of conflicting interests

No conflict of interest.

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