

Sero-prevalence of Blood Borne Agents among Voluntary Blood Donors

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Abstract

Introduction: Blood transfusion is a significant life-saving intervention in the present era of patient management system. As the blood and blood products are a potential source of infections and the necessity of transfusion is increasing day by day, transfusion transmissible infections have become a major threat to the system of ensuring safe transfusion.

Objectives: To find out the sero-prevalence of Hepatitis B, Hepatitis C, HIV, Syphilis and Malaria parasite among the blood donors and to ascertain risk behaviour of the blood donors.

Materials and Methods: This descriptive cross-sectional study was conducted on purposively selected 115 blood donors at Armed Forces Institute of Pathology (AFIP) during the period of 1st September to 31st December 2011.

Results: The study revealed among 115 blood donors 7.8% were HBsAg positive. More than half of the HBsAg positive cases 66.67% were from civilian. None of the respondents was found positive for anti-HCV, VDRL, Malaria and anti-HIV. All of the donors in this study were voluntary donors. The sample studied had a mean age of 28.03 ± 6.79 years and 90.5% of donors were belongs to age group 18-37 years and female was only 6.1%. Most of the donors (49.5%) were military personnel, 86% above SSC educated and 22.6% had visited abroad. Regarding risk behaviour 38.3% had the history of undertaking dental procedure, 0.9% were found undertaking blood transfusion, 2.6% had the history of illicit sex and 29.6% had the history of suffering from jaundice and among them only 1.7% were found HBsAg positive.

Conclusion: The study finding demands motivation against unnecessary blood transfusion. It also emphasize health education programme among peoples having risk behaviour.

Key-words: Blood donor, Transfusion transmitted infections, HBV, HCV, Malaria parasite.

Introduction

Blood transfusion is a life-saving intervention that has an essential role in patient management within health care systems. In 1818, the first successful transfusion was recorded. It was performed by James Blundell, a British obstetrician, who transfused blood to a mother that suffered post-partum

haemorrhage¹. Blood Transfusion Service (BTS) in Bangladesh started in 1950 at the Dhaka Medical College Hospital. In 1976 the "Bangladesh Council of Blood Transfusion Service" was established to supervise and monitor improvement of BTS in the country. The importance of ensuring blood safety as well as the adequacy of the national blood supply are highlighted due to the emergence of HIV in the 1980s. The global burden of diseases due to unsafe blood transfusion can be eliminated or substantially reduced by adopting an integrated strategy for blood safety. In the year 2000 the Government of the Peoples Republic of Bangladesh with assistance from UNDP, has launched a blood screening programme all over the country through 97 blood transfusion centers from the districts towards the national level hospitals. The following screening tests were performed in the blood transfusion centers: HBsAg, VDRL, Malaria Parasite, anti-HCV, anti-HIV2.

The growing problem of transfusion transmissible infections (TTIs) has been acknowledged in Bangladesh like other countries of the world. As an integral part of the healthcare system, the objective of BTS of Bangladesh is to ensure safety, adequacy, accessibility and efficiency of blood supply at all levels. To reach this goal, the Bangladesh Government has passed "Safe Blood Transfusion Law 2002" in the Parliament and "Safe Blood Transfusion Rules 2008", also published in June'08. Now 98 centers are functioning under the Safe Blood Transfusion programme in Bangladesh. It is mandatory to perform five TTI tests on donated units. All private and public centers are supposed to perform all five mandatory TTI tests and quality control system is supposed to be maintained by Safe Blood Transfusion programme². To find out the sero-prevalence of Hepatitis B, Hepatitis C, HIV, Syphilis and Malaria parasite among the blood donors and to ascertain risk behaviour of the blood donors.

Materials and Methods

This was a descriptive cross-sectional study, carried out from 01 September to 31 December 2011, among 115 blood donors attended at Haematology Department of Armed Forces Institute of pathology (AFIP), Dhaka Cantonment, Dhaka. Sampling technique was purposive. Data were collected by face to face interviews with a questionnaire. Laboratory test results were recorded from the Haematology Department of AFIP by check list. The data were analyzed by the SPSS 17 version.

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Results

A total of 115 blood donors 90.5% were in the age group between 18-37 years, 93.9% were male and 49.5% were military personnel. Most of the respondents 97.4% were muslims, 93.9% were in the income group between lower and middle class, 50.4% had blood group O+ve and 55.7% were anaemic (Table-I). Among all respondents 22.6% had history of visiting abroad, 38.3% were undertaken dental procedure, 29.6% had the history jaundice, 7.8% had the history of malaria 2.6% had the history of illicit sex and 0.9% was undertaken blood transfusion (Table-II). Only 7.8% respondents were HBsAg positive and all other screening test like HBV, HCV, malar parasite were found negative (Table-III).

Table-I: Distribution of respondents by socio-demographic characteristics (n=115)

Characteristics	Frequency	Percentage	
Age in years	18- 27	63	54.8
	28- 37	41	35.7
	≥ 38	11	9.6
Sex	Male	108	93.9
	Female	7	6.1
Education status	≤ Class V	10	0.9
	Class VI-IX	15	13.0
	SSC	25	21.7
	HSC	32	27.8
	≥ Graduate	43	37.4
Occupation status	Military Svc	51	44.3
	Civilian of Military Svc	6	5.2
	Civil Svc	25	21.7
	Business	6	5.2
	Student	21	18.3
	Other	6	5.2
Social class	Lower	46	40.0
	Lower middle	48	41.7
	Upper middle	14	12.2
	Upper	7	6.1
Religion	Muslim	112	97.4
	Hindu	3	2.6
Blood group	A+ve	16	13.9
	B+ve	36	31.3
	AB+ve	4	3.5
	O+ve	58	50.4
	A-ve	1	0.9
Hemoglobin status	Anaemia	64	55.7
	Non-anaemia	51	44.3

Table-II: Distribution of respondents by risk behaviors (n = 115)

History of risk behaviors	Frequency		Percentage	
	Yes	No	Yes	No
History of blood transfusion	Yes	1	0.9	
	No	114	99.1	
Illicit sex	Yes	3	2.6	
	No	112	97.4	
History of visiting abroad	Yes	26	22.6	
	No	89	77.4	
History of dental procedure	Yes	44	38.3	
	No	71	61.7	
History of jaundice	Yes	34	29.6	
	No	81	70.4	
History of malaria	Yes	9	7.8	
	No	106	92.2	
History of blood transfusion	Yes	1	0.9	
	No	114	99.1	

Table-III: Distribution of respondents by screening test (n = 115)

Test Result	Screening Test				
	HBsAg	HCV Ab	HIV Ab	VDRL	MP
Positive	9(7.8%)	0	0	0	0
Negative	106(92.2%)	115(100%)	115(100%)	115(100%)	115(100%)

Discussion

A total 115 donors' blood was screened for the agent se.g HBV, HCV, HIV, Syphilis and Malaria which is a routine practice of AFIP. In this study, it was revealed that 7.8% of the blood donors were HBsAg positive. The findings is higher than the 1.38% previously reported by Chowdhury FS et al³ in Dhaka medical college hospital, the 4.19 % among Armed Forces donors and 3.17% among civilian donors by Mondol MEA et al⁴ in AFIP, the 3% reported by Zaki MH et al⁴ in ICDDR,B,⁵ the 6.2% reported by Mujib SA, et al⁶ in Pakistan, the 1.82% reported by S. Awathiet al⁷ in India, the 2.1% reported by Louie et al⁸ in Canada. The relatively higher incidence of seropositivity of HBsAg in the present study might be due to negligence in donor selection practices like; exclusion of donors was not done by physical examination and past history of jaundice etc. Besides sample taken in the present study was purposive sampling of non-probability in nature which might also be the reason.

It was observed that among the respondents 7.8% seroprevalence of HBsAg found in this study is lower than the 8.8% previously reported by Mecky Matee, Pius Magesa, Eligius Lyamuyain Tanzania⁹, the 47.9% reported by Julie Egesie, Emmanuel Joseph, Umezuruke Egesie et al in Nigeria¹⁰ the 10.6% reported by Jocelijin Stokx, Philippe Gillet, Anja Weggheleire et al in Mozambique¹¹ the 18.6% reported by Fiekumo Buseri, Musa Muhibi, Zaccheaus Jeremiah in Nigeria¹². The relatively lower incidence of seropositivity of HBsAg in the present study due to the fact that the respondents of that area were staying high endemic area of Hepatitis B.

In this study, it was seen that more than half of the HBsAg positive cases 66.67% were from civilian. Among the 7.8% HBsAg positive cases 6.1% were belong to age group 18-37 years (younger age

group). It demands thorough screening of civilian blood against blood borne agents and also younger age group. It differ from Mondal MEA, Giti S, Rahman ASMM in AFIP 2000 with regard HBsAg seropositive more prevalent among Armed Forces than civilian donors (4.19% vs 3.17%). It was found in this study that all the blood donors were apparently healthy; the 7.8% HBsAg seropositivity indicates a carrier state or an active infection. A study by Khan M in Bangladesh find out that HBV account for 35% acute viral hepatitis, 40.5% chronic liver diseases, 36.5% hepatocellular carcinoma¹³. The 7.8% seroprevalence of HBsAg indicates that some respondents may go on to develop chronic hepatitis, cirrhosis and some may even progress to develop hepatocellular carcinoma, given the reports that HBV causes acute and chronic hepatitis with a high tendency to progression to cirrhosis and hepatocellular carcinoma. It was not known to HBsAg seropositive respondents regarding their disease. It was screening test by which respondents could know about the disease earlier and could take proper measures.

None of the respondents in the present study was found to be positive for anti-HCV, VDRL, Malaria and anti-HIV. It indicates that the respondents were low risk group. This might be due to the fact that the respondents were in non-endemic area of malaria, better socioeconomic and sanitary condition, education level, personal protective measure and overall health consciousness. Moreover data was collected for only one month and purposive sampling technique was adopted. It may contribute to the negative result. A study conducted by Mondal MEA, et al in AFIP in 2000 revealed that anti-HCV was found positive in 1.85% and 0.82% were reactive for VDRL test⁴. The cause behind not finding Hepatitis C and Syphilis cases in the present study might be due to several factors e.g the data for the present study was collected for only one month, whereas the previous study was conducted for an extended period of time (three years). Another factor may be behavioural change of the respondents and practice of safe health procedure in all aspect of life. The similar study conducted by Mondal MEA, et al in AFIP in 2000 and was observed that HBsAg and VDRL seropositivity statistically significant in different age group of donors⁴. No such relationship was found in the present study as there was no seroprevalence of VDRL in the present study. In this study it was seen that all the respondents were voluntary donors. Unfortunately, in Bangladesh a considerable amount 16% of blood is still collected from professional blood donor, though the numbers of professional donors are decreasing gradually¹⁴.

Since 2001 all the countries of SEAR except Bangladesh has banned professional donation¹⁵. It is due to that this study was conducted in a single institution of Armed Forces installation where some restrictions were imposed for general people. A study conducted by Kundu NC, et al in Rajshahi Medical College reported that 8.14% professional blood donors and 5.48% volunteer blood donors were positive for HBsAg¹⁶. It indicates that volunteer blood donors are relatively low risk population than professional donors. It differ with regards to no professional donors were observed in current study.

It was observed that the mean age of the blood donors was 28.03, SD \pm 6.79 and most of the donors 90.5% were in age group 18-37 years followed by 9.6% in age group 38 years and

above. The result was similar with the study of Mondal MEA et al⁴ in AFIP where age group 18-37 years were 92.98% and 38 years and above were 7.02%. This is an indication of increased awareness to donate blood amongst the younger generation and very poor participation to donate blood among middle age group. In Bangladesh eligible age for blood donation is 18-60 years¹⁷. It indicates that majority of middle age and all of older age people were not participating in blood donation. It might be due to cultural and social stigma. In this study 6.1% HBsAg positive cases were in age group 18-37 years. Statistically, there is no significant difference on the prevalence of HBsAg positivity according to age. In this study it was found that most of the donors 93.9% were male and few of donors 6.1% were female. It means majority of female donors were not participating in blood donation. This indicator male overwhelming dominated the donor population. This trend of male domination is a regular feature of Bangladesh blood donation sites and is commonly observed during blood donation campaign. This trend may be due to male dominated system of our society.

It is evident from this study that most of the respondents 86% was above SSC. It does not accord¹⁸ with the adult literacy rate 59.1%. In this study literacy rate was more, as most of the respondents 49.5% were military personnel (military and civil military). For military services minimum qualification of services is SSC, whereas for civil military services also some educational qualification is required. In this study it was revealed that among the respondents 97.4% were muslims and other 2.6% were hindus. This study depicts that the mean monthly family income of the respondents was 22555.65 Taka per month, which is much higher than national¹⁸ per capita monthly income 7203. This difference may be due to recent up gradation of national pay scale and most of the respondents were service holder. In this study only 22.6% of the respondents were visited abroad and out of them 73.08% respondents were in abroad (last visit) more than 12 months back. None of these respondents had positive seroprevalence for STD. It might be due religious obligation.

From this study it revealed that no statistically significant relationship was found among the socio-demographic condition of the respondents and HBsAg. In this study, 38.3% of the respondents were undertaken dental procedure and among them only 1.7% of the HBsAg positive cases had the history of under taking dental procedure. Thorough history taking can easily identify these sorts of risky cases. Low prevalence of HBsAg related to dental procedure might be due maintenance of proper sterilization in CMH. Among the donors in this study a very few 0.9% were undertaken blood transfusion. It is due to the fact that study was conducted in a single institution and all donors were from army community and their relatives and were healthy. It depicts that few number of donors 2.6% had the history of illicit sex. It might be due to religion obligation, education and practices of healthy life-styles. It is evident from this study that 29.6% had the history of suffering from jaundice. It might be due to negligence of donor selection practices. Donation is done unnecessary. Among them only 1.7% were found seropositive for Hepatitis B. Statistically, there is no significant difference on the prevalence of HBsAg positivity and jaundice cases. But HBsAg positive cases are considered risky as it can turn

into chronic hepatitis, cirrhosis and hepatocellular carcinoma. From this study only 7.8% of the donors had history of suffering malaria. All of them were military personnel and were infected in CHT or Africa while in UN Mission. Though prevalence of *P. falciparum* in CHT and Africa is more. It may cause severe *falciparum* malaria. None of respondents was found malaria parasite in blood. It might be due to large numbers of donors are from non-endemic area of malaria and a few who had history suffering malaria were treated properly.

From this study it revealed that regarding risk behaviors and transfusion transmissible diseases except Hepatitis B none was remarkable. It might be due to the fact that this study was conducted in a single institution, so result may have been influenced by characteristics of the donor population, specific practices in donor selection or sensitivity or specificity of the screening assay used. Therefore, results may not represent the other segments of the society or population. This study was conducted in a single institution, so result may have been influenced by characteristics of the donor population and specific practice in donor recruitment. Therefore, results may not represent the other segment of the society or the population.

Conclusion

A substantial percentage of HBsAg sero-prevalence is present in the blood among blood donors. None of the blood donors was found to be positive for Malaria, Syphilis, anti-HCV and anti-HIV. This might be due to the fact that the respondents are in non-endemic area of malaria, better socioeconomic and sanitary condition, education level, personal protective measure and overall health consciousness. The safety of the blood supply is dependent on collecting blood from voluntary donors from low-risk populations, screening donated blood for transmissible infections and avoiding unnecessary transfusions. These activities need to be carried out by a well-coordinated blood transfusion service with quality control being implemented at all levels.

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