Frequency of Transfusion Transmitted Infections in Blood Donors of Prime Medical College Hospital, Rangpur, Bangladesh

Prof. Md. Mominul Haq[1], Neaz Ahmed[2], Md. Sahadat Hossain[3]
Md. Rafiul Haque[4]

Abstract:
Blood transfusion is a distinct mode of transmission of infections to the recipients. Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), malaria and syphilis can be easily transmitted to the recipients during blood transfusion. Transfusion transmitted infections (TTIs) create major burden on health care system. Blood donor selection is very much important because infected individuals serve as an asymptomatic reservoir and a potential source of transmission of some diseases. A retrospective study was carried out over a period of three and a quarter years' i.e. from 02/05/2016 to 03/08/2019 in the northern area of Bangladesh. The study was performed to determine the prevalence of transmission of HBV, HCV, HIV, malaria and syphilis during blood transfusion in order to provide information for relevant national health policies. Out of 8356 sample of blood donors, recorded mean prevalence for HBsAg, HCV, HIV, malaria and syphilis was 0.957%, 0.047%, 0%, 0% and 0.287% respectively. This study reflect that blood transfusion is one of the major risk factors of spread the TTIs which showed the importance of the mandatory screening of these infection markers during donation of blood.

Indexing words: TTIs, HBV, HCV, HIV, Malaria, Syphilis, Blood donors.

Introduction:

Heaptitis B virus (HBV), Hepatitis C virus (HCV), Human immune deficiency virus (HIV) and syphilis are the most important agents in transfusion transmitted infections (TTIs) and these diseases are a great health care problem in the world. In Bangladesh, especially in the Hill tracts, malaria is additional health burden. The incidence rate throughout the world are not easy to determine given the asymptomatic and latent nature of the diseases before the clinical presentation[1]. Every blood transfusion therefore carries a potential risk for transmissible diseases[1,2]. According to the WHO estimate, the lack of effective screening of blood donors results in up to 16 million new infections with hepatitis B, 5 million new infections with hepatitis C and 160,000 new cases of HIV infections every years[3].

Blood transfusion is a therapeutic procedure, as there is no genuine substitution. But contaminated blood transfusion can transmit infectious diseases and can be fatal instead of saving life. Safe blood transmission services are very much important for high quality health care system[4] and require organized structure, well-educated staff and uninterrupted electricity supply.

Evaluation of datas on these prevalence of TTIs among blood donors permits an assessment of the accurate estimate of risk of TTIs which helps in the creation of long-term strategies to improve public health and to prevent spreading of the disease in the population[1]. The purpose of present study was to provide the detail epidemiological analysis of TTIs in blood donors of northern part of Bangladesh.

Methods:

The present retrospective study was carried out at blood bank of Prime Medical College Hospital, Rangpur after due ethical clearance from the institutional ethical committee. The data of present study corresponds to period of May of 2016 to July of 2019 and includes in house voluntary and replacement donors. The donors were first required to fill up a registration form which includes all the information like personal details, occupation and medical history.

1. Professor (CC), Dept. of Physiology Prime Medical College, Rangpur.
2. Assistant Professor, Dept. of Biochemistry Rangpur Medical College, Rangpur.
3. Assistant Professor, Dept. of Biochemistry Prime Medical College, Rangpur.
4. Medical Officer, Islami Bank Community Hospital, Rangpur Limited, Rangpur.

Hemoglobin estimation was performed and donors with haemoglobin less than 13g/dl were excluded. The donors were then screened by medical officer according to blood donor selection criteria. Only the first time donors were included in this study. Individuals with good health and physically fit were selected as blood donors. The age range of the donor was 18 to 55 years. The donors were then asked to sign the donor questionnaire and consent form. Any sunject who have previous history of HBV, HCV and HIV infections were excluded from the study. Blood sample was collected and tested in the blood bank of Prime Medical College Hospital. HBsAg, anti-HCV, anti-HIV and Venereal Disease Research Laboratory test (VDRL) for syphilis were detected using BEST2000 ELISA (Biokit, Spain), according to manufacturer's instructions. All seropositive samples were re-tested for the confirmation with the same serological test kit for confirmation.

Observations and results:

The study was based on records of blood bank. Total number of donor is 8356.

HBV infection: HBsAg positive rate for blood donors was found to be 0.957% (80 out of 8356 donors)

HCV infection: HCV prevalence was found to be 0.047% (4 out of 8356 donors)

HIV infection: HIV prevalence was found to be 0.000% (0 out of 8356 donors)

Malaria infection: Malaria prevalence was found to be 0.000% (0 out of 8356 donors)

Syphilis infection: VDRL was found to be reactive in 0.287% donors (24 out of 8356 donors).

Table 1: Percentage of doners infected by different infections (n=8356)

Infections	No of doners infected	percentage
HBV infection	80	0.957%
HCV infection	4	0.047%
HIV infection	0	0
Malaria infection	0	0
Syphilis infection	24	0.287%

Discussion:

Hepatitis B and hepatitis C are the two of the common causes of chronic liver diseases. In this regard, hepatitis B is leading which is followed by hepatitis C disease. Chronic liver diseases result in a fatal disease called cirrhosis of liver [5,6,7]. HIV causes acquired immune deficiency syndrome (AIDS). In this disease condition the defensive immune system of the body is depressed. As a result, the patient becomes prone to develop various other infectious diseases[8]. In Bangladesh, malaria is endemic in 13 of 64 districts. About 14 million people in this country are at risk of the disease[9]. Syphilis may involve the central nervous system and may cause permanent disabilities. It is one of the common sexually transmitted diseases[10]. Limited surveillance data is present for HIV and syphilis in Bangladesh. In this country, the prevalence of AIDS remains low, certainly lower than the neighbouring countries[6]. Therefore, Bangladesh still has opportunity to take proper steps to prevent its spread.

Some authors state that blood donors may not be considered the representative of general population as the prevalence rate may underestimate or overestimate due to their different characteristics[11,12].

Hepatitis B and hepatitis C viruses are mostly transmitted as blood borne diseases. Needle sharing to prepare or inject drugs is responsible for easy transmission. In our country, now a days, disposable syringes are widely used. Moreover, blood transfusion is performed after proper screening tests. Therefore, in this present study, the number of positive HBV and HCV cases is not so alarming.

In Brazil, screening tests among blood donors was mandatory in 1993. That is one of the significant factors of low magnitude of hepatitis in all studied population in Brazil[13].

In the present study, prevalence of hepatitis B is more than hepatitis C infection. Not a single donor was found infected by HIV and malarial parasite. But the screening tests revealed 0.28% positive donors for syphilis. HIV is mainly spread by having sex or sharing needles. In Bangladesh, still the religious values are better than many other countries. That is why no positive HIV cases were found in this study. Malaria is not endemic in the northern part of Bangladesh. This fact is reflected in this study also.

Conclusion:

Safe blood, free from transfusion transmitted infections is our desired goal. In our country,

frequent screening before blood transfusion is widely practiced. Needle sharing is no longer continued here. Religious practices in Bangladesh are still remarkable. Therefore, the present situation, specially for HBV and HCV is not so alarming. But similar studies should be conducted in different places in our country to know the overall real condition of TTIs, so that more effective measure can be taken accordingly. Results of this study reflect that more effective procedure should be adopted in the screening tests to prevent the transmission of transfusion mediated infections more effectively.

References:

1. Bhawani Y, Rao PR, Sudhakar V. Seroprevalence of transfusion transmitted infections among blood donors in a tertiary care hospital of Andhra Pradesh. Biol Med. 2010; 2(4):45-48.
2. Khan S, Attaullah S, Khan SN, Shams S, Ali I, Bilal M, Siraj S. Molecular epidemiology of HCV among the health care workers of Khyber Pakhtunkhwa. Virol J.2011; 8(1):105.
3. Improving blood safety worldwide [editorial]. The Lancet 2007 August 4; 370:361.
4. Manzoor I, Hasmi N, Daud S. Seroprevalence of transmission transmissible infections (TTIs) in blood donors. Biomedica. 2009; 25:154-158.
5. Sobia A, Sanaullah K, Jabbar K. Trend of transfusion transmitted infections frequency in blood donors: provide a road map for its prevention and control. J Transl Med.2012; 10:20.
6. Mamun M. Past, present and future of viral hepatitis in Bangladesh. Eurosian J Hepatogastroenterol.2016 Jan-Jun; 6(1):43-44.
7. Zaman H, Rahman A, Yasmin M. Epidemiology of hepatitis B virus infection in Bangladesh: Prevalence among general population, risk groups and genotype distribution. Genes (Basel). 2018 Nov; 9(11): 5541.
8. Azim T, Khan SI, Haseen F, Huq NL, Hennig L, Pervez M, Chowdhury ME, Sarafian I. HIV and AIDS in Bangladesh. J Health Popul Nutr. 2008 Sep; 26(3):311-324.
9. Haque U, Overgaard J. Malaria burden and control in Bangladesh and prospects for elimination: an epidemiological and economic assessment. The Lancet Global Health. 2014 February; 2(2):98-105.
10. Nessa K, Waris S, Sultan Z, Monira S, Hossain M, Nahar S, Rahman H, Alam M, Baatsen P, Rahman M. Epidemiology and Etiology of sexually transmitted infections among Hotel-based Sex workers in Dhaka, Bangladesh. J Clin Microbiol.2004 Feb; 42(2): 618-621.
11. Ali SA, Donahue RMJ, Qureshi H, Vermund SH. Hepatitis B and hepatitis C in Pakistan: Prevalence and risk factors. Int J Infect Dis. 2009; 13(1):9-19.
12. Jafri W, Jafri N, Yakoob J, Islam M, Tirmizi FA, Jafar T, Akhtar S, Hamid S, Shah HA, Nazmi SQ. Hepatitis B and C: Prevalence and risk factors associated with seropositivity among children in Karachi, Pakistan. BMC Infect Dis. 2006; 6:101.
13. Resende VL, Abreu MH, Paiva SM, Teixeira R, Pordeus SA, Nazmi SQ. Factors associated with seroprevalence of hepatitis C among dentists at a large Brazilian city. Virol J. 2009; 6:228.

Corresponding address
Prof. Dr. Md. Mominul Haque
Department of Physiology
Prime Medical College, Rangpur.
Email: mominphysiol@gmail.com
Cell phone: 01712807357