

# Prevalence of blood transfusion transmitted infections (HIV, HCV, HBV, Syphilis & Malaria) among the blood donors in a specialized hospital

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## ABSTRACT

**Background:** Blood transfusion is a life-saving intervention but may be a good source of transmission of various infectious and parasitic diseases. To ensure safe blood transfusion, all donors are systematically screened for transfusion-transmissible infections (TTI) including Hepatitis B and Hepatitis C, HIV, malaria, and syphilis. Transfusion transmitted infections are one of the major side effects of blood transfusion. We can prevent them by history taking and physical examination of blood donors and proper screening of blood products. The aim of the present study was to analyze the TTI prevalence rate among blood donors through screening test.

**Materials and methods:** A retrospective observational study was conducted at Evercare Hospital Chattogram from April 2021 to February 2024. Blood screening was done by Immuno-chromatographic test (ICT) and RPR card test method.

**Results:** Over a period of 35 months total blood donation was 4,226. The overall prevalence of HBsAg, HCV, HIV, syphilis, and malaria were 0.35%, 0.07%, 0.0%, 0.04 % and 0.02% respectively. Most of the donors were male (99.53%) and directed donors (98.10%).

**Conclusion:** It should be ensured that all reactive donors notify the reactivity of screened disease. It is also necessary to develop nationally acceptable guidelines for notification and follow-up of responsive donors. This infected product could have become a source of infection for hundreds of people. Nucleic acid amplification testing (NAT) must be applied to identify positive blood donors during the window period before sero conversion. Information to TTIs reactive donor is the best method to prevent the chance of repeated reactive donation.

**Keywords:** HIV, HCV, HBV, Transfusion-transmitted infections, NAT.

## INTRODUCTION

Blood transfusion consists in administering full blood or one of its components, that collected from an individual called donor, to one or many other individuals called recipient. Every year millions of people around the world donate and receive blood or its components. We must ensure safety of both donors and recipients of blood. An integral part of this safety chain includes: the donor's detailed medical history, highly maintain donor deferral criteria, proper cleaning of the phlebotomy site to prevent the risk of bacterial contamination, and extensive laboratory testing of donated blood to minimize the risk of transfusion-transmitted infections (TTIs) to as low as zero. Blood transfusion services should therefore establish efficient systems to ensure that all donated blood is correctly screened for specific TTIs and that only

non-reactive blood and blood components are released for use. Currently, no technology exists to completely detect all window period donations. No matter how sensitive Nucleic acid amplification testing (NAT) becomes, we will never be able to completely close the exposure-to-seroconversion window period. Thus, while blood transfusion can be life-saving, there are associated risks, particularly the transmission of blood borne disease. The aim of the study was to analyze the prevalence of transfusion transmission infections among blood donors through screening test.

## MATERIALS AND METHODS

This retrospective observational study was conducted at the Department of Transfusion Medicine Evercare Hospital Chattogram from April

2021 to February 2024. The age limit of donors was 18 to 60 years. Informed consent was taken from all donors before donation and fulfilling the criteria of a donor according to institutional protocol. Blood samples were collected in pre labelled pilot tube after collection. Serum was separated from clotted blood. Screening of HBsAg, Anti-HCV, Anti-HIV, and Malaria were done by Immuno-chromatographic test (ICT) and syphilis by RPR card test in accordance with the instruction of reagent manufacturer.

**RESULTS**

A total of 4,226 blood samples were taken from donors. Out of this prevalence of HBsAg, HCV, syphilis and malaria, HIV were 0.35%, 0.07%, 0.04% and 0.02%, nil respectively. 99.53% of donors were male. Distribution of type of donors were directed 4146 (98.10%), replacement 40(0.95%) and voluntary 40(0.95%) respectively (Table 2).

**Table 1:** Blood donation during study period

Study Years	Blood donation
2021(Since April)	405
2022	1219
2023	2210
2024(upto February)	392
<b>Total</b>	<b>4226</b>

**Table 2:** Prevalence of TTIs

Year	HBsAg	HCV	HIV	Malaria	Syphilis
2021	1	0	0	0	0
(Since April					
2022	6	1	0	0	0
2023	7	2	0	1	1
2024	1	0	0	0	1
(Up to					
February)					
Total	15	3	0	1	2
Percentage	0.35%	0.07%	0%	0.02%	0.04%

**DISCUSSION**

In this study, voluntary donation was poor (only 40, 0.95%), maximum donor was directed donor (98.10%) and predominantly male. Prevalence of HBsAg, HCV, syphilis and malaria, HIV were 0.35%, 0.07%, 0.04% and 0.02%, nil respectively in our study. In another study in Bangladesh

showed that out of 21,448 donors, 4464 (20.81%) were voluntary and 16984 (79.19%) were relative donors. Among 21448 donors, 21081 (98.29%) were selected and 367 (1.71%) were rejected. On analyzing the 367 rejected cases, HBsAg positive 297 (80.93%), anti HCV positive 38 (10.35%), malarial parasite positive 23 (6.27%), Treponema Pallidum positive 9 (2.45%) and none found positive for HIV<sup>1</sup>. Study in KMCH, HBsAg positive (1.39%), HCV positive (0.024%), HIV positive (0.008%)<sup>2</sup>. In a study in Canada, HBsAg positive (12.40%), HCV positive (16.83%), HIV positive (0.38%)<sup>3</sup>. In a study in Italy HBV positive was (4.86%)<sup>4</sup>.

A fundamental part of preventing TTI is to notify and counsel reactive donors. TTI-reactive donor notification is essential for early clinical intervention to minimize their disease and the risk to the partners/close contacts. As per the present protocol, we informed all reactive donors about the abnormal test results, counselled, and referred for further confirmation and management to the concerned specialty. In an Indian study by Patelet al. 236 (60.36%) donors showed a positive response following donor notification<sup>5</sup>. In another study by Agarwal et al. involving 416 reactive donors, only 249 (59.8%) donors turned to transfusion facility and attended counselling after receipt of their reactive status<sup>6</sup>. The counselling success rate at large blood center in southern India was 41.18%, 11.11%, and 14.63% for HBV, HIV, and HCV, respectively<sup>7</sup>.

Currently in Bangladesh, most of the blood banks do not have the facility to perform confirmatory tests for TTI. The donors are informed only on the basis of their screening tests available in blood bank. As most of the donors do not expect to hear that they have reactive results. They may become extremely distressed to hear this news. These donors may be highly motivated to donate, having desire to help others, or simply want some time off work or may have other motives. This, unfortunately, may leave the donor with a negative feeling towards blood donation or diminish his/her own self-worth<sup>8,9</sup>. On the other hand, a small minority of individuals appear to ignore notification

and continue to donate blood elsewhere. Some of the donors even use blood donations as a means for free testing because of their high-risk behavior.<sup>10</sup> Donor notification can therefore be a challenging task demanding special skills from the staff involved who should always be prepared to meet new challenges and help donors. The onus lies with the donor to contact the blood bank<sup>11</sup>. There is very little information available about donor behavior on receipt of reactive TTI results.

## CONCLUSION

The present study has limitations in the use of rapid test for TTIs screening. The latest more sensitive method such as NAT may uncover latent infections in the window period and may actually suggest underestimation of prevalence by currently used screening tests in the present study. This implies that screening for TTI needs to be upgraded across blood banks in our country. HBV was the most prevalent TTI of all, therefore there is a need to initiate efforts for community-level health programs for HBV in addition to the UIP (Universal Immunization Program) with the HBV vaccine that started in 2007, and the government should focus on the current youth population who were not vaccinated during childhood. Voluntary blood donors are safe. So we should encourage voluntary blood donation.

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