

Seroprevalence of HIV, HBV & HCV in Pre Transfusion Screening of Blood Donors At A Tertiary Health Care Center In North East India

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Abstract

Background: Frequent, periodic screening of transfusion-transmissible infections (TTIs), like human immunodeficiency virus (HIV), hepatitis B and hepatitis C virus (HBV and HCV), in blood donors is imperative to maintain transfusion safety.

Aim: This study determines the seroprevalence of HIV, HBV, HCV among blood donors at a tertiary health care center in North East India.

Materials and methods: This is retrospective study where total of 10530 blood units for a period of 3 years January 2015 to November 2017 were tested by ELISA methods.

Results: The seroprevalence of HIV, HBsAg, HCV was 0.31%, 1.05%, 0.25% respectively in total donors.

Conclusion: The prevalence of transfusion transmissible infections is declining, which is an encouraging trend for the community.

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I. Introduction

Frequent, periodic screening of transfusion-transmissible infections (TTIs), like human immunodeficiency virus (HIV), hepatitis B and hepatitis C virus (HBV and HCV), in blood donors is imperative to maintain transfusion safety. This study determines the seroprevalence of HIV, HBV, HCV among blood donors at a tertiary health care center in North East India. Blood donation is a significant procedure that saves millions of lives; nonetheless, unsafe transfusion practices may put millions of people at risk of transfusion-transmissible infections (TTIs) (1). Unsafe blood transfusions may have tremendous negative implications both economically and health wise. Long-term morbidity and mortality, delayed viraemia and hidden states resulting from the transfusion of infected blood have far-reaching consequences, not only for the recipients themselves, but also for their families and their communities (2). A number of viruses, bacteria and parasites can be transmitted through blood or blood products. Amongst these, hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) are the most serious infections transmitted during blood transfusion (3,4). HBV, HCV, HIV infections are common serious complications of blood transfusion. Prevention of TTIs in developed countries has been achieved by reducing unnecessary transfusions, using only regular voluntary donors, excluding donors with specific risk factors and systematic screening of all donated blood for infection. By contrast, in many developing countries none of these interventions are applied uniformly and the risk of transfusion-transmitted infections remains high (5). Despite the progress in the diagnosis and treatment, the incidence of viral hepatitis is still high in some parts of the world. In the purview of globalisation, all regions are exposed to the risk of viral infections (3,4). Clerical errors like release of unsuitable blood units, accidental transfusion of autologous blood to another recipient and errors in testing also contribute to transfusion induced transmission of harmful agents (6). WHO recommended that all blood donations should be screened for infection prior to use. Globally there are >300 million HBV infected people and 75% of them are Asians (7). According to NACO, in India there are around 2 to 3 million HIV infected people with the prevalence of 0.31% among adults (8). With each unit there is 1% risk of transfusion associated complication including TTI (9). Hence it is extremely essential to be cautious about the possible spread of these diseases in the course of blood transfusion.

II. Materials & Methods

2.1 Study design

This is a retrospective study conducted in Tripura Medical College & Dr. B R Ambedkar Teaching Hospital blood bank in Tripura. Data was collected from January 2015 To November 2017 for a period of 3 years.

2.2 Study population

Total 10530 units were collected through voluntary blood donations in camps as well as in the blood bank. Male and female donors between the age group of 18 to 60 years having weight more than 45 kg were included while persons having history of hypertension, diabetes, epilepsy were excluded, also donors having treatment for these diseases were excluded. Lactating and pregnant females were excluded.

2.3 Methods

The blood from voluntary donors was collected according to WHO guidelines [7] and detailed past history of immunisation was taken. In the blood bank sera were separated and all the units were screened for HIV, HBV, and HCV by NACO approved ELISA kits using immunochromatographic sandwich assay principle.

YEAR	Total no. of donors
2015	1332
2016	5686
2017	3512

All the initial reactive samples were retested, confirmed and these units were discarded as per the WHO guidelines. Validity of test was assured as per given criterion.

2.4 Statistical analysis

The data entry was carried out using Microsoft Excel worksheet and percentage and proportions for each variable was calculated.

Ethical issues

This study was approved by our institutional authority. The written, informed consent from the donors was taken at the time of donation

Limitations

The improved screening and testing of blood donors has significantly reduced transfusion transmitted diseases in most developed countries. This has not been so in developing nations like India because lack of awareness, highly qualified human resources and lack of proper standard operating procedures. With the

Year	HIV	HBV	HCV
2015	0.75%	1.68%	0.76%
2016	0.04%	0.64%	0%
2017	0.16%	0.83%	0%
Average	0.31%	1.05%	0.25%

implementation of strict donor criteria, proper health education it may be possible to reduce the incidence of TTI in the Indian scenario.

III. Results

We had collected total 10530 units of blood during 3 years period of time. Year wise seroprevalence of HBV , HIV , HCV along with relative percentage have been described in various tables. From above table it is evident that seroprevalence of all transfusion transmissible infections went on progressively decreasing from the year 2015 to 2017.

IV. Discussion

Transfusions of blood and blood components, as a specialised modality of patient management save millions of lives worldwide each year and reduce morbidity. But it is also associated with a large number of complications, some are only trivial and others are potentially life threatening. Knowledge of the prevalence of

the transfusion transmissible infections among the blood donors will guide to develop and implement efficient strategies for ensuring safety in blood donors. Though the prevalence of HBV in Indian national healthy donor is 4.7% [9,10] in our study it was 1.05% which is lower than older studies [11-13] Hepatitis C infection is an evolving global health problem. In Indian scenario, the prevalence of HCV is higher at Ludhiana [14]. In the present study HCV prevalence is 0.25% which was much lower than other studies [15,16]. In 2010, 2.7 million people were newly infected by HIV [17]. In the present study prevalence of HIV was found to be 0.31% which is lower than previous studies [18, 19]. This decline is attributed to evolving medical education and meticulous donor selection criteria. Overall there is decline in seroprevalence of transfusion transmissible infections may be due to more public awareness, use of newer generation kits having improved sensitivity and specificity, proper donor selection and education as per NACO guidelines. Blood samples collected in latent period may be infectious despite of negative antibody test [20] so addition of nucleic acid testing (NAT) will help to detect very low levels of viral RNA or DNA present in the blood.

V. Conclusion

Thus the present study concludes that the seroprevalence of transfusion transmissible infection is declining which is good signal for community health.

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