

## **Study of Blood Donation Transmitted Infections**

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### **Abstract**

Blood transfusion is an effective treatment for saving millions of lives, even though transfusion-transmissible infections are a major problem. An integrated approach for blood safety is required, which includes the collection of blood only from voluntary, non-remunerated blood donors. The emergence of Transfusion-Transmitted Infectious agents (TTIA) poses new challenges to ensuring safe blood transfusions, as these infections can include hepatitis B, hepatitis C, HIV (human immunodeficiency virus), syphilis, and malaria, among others. The objective of this study is to analyze the blood donation patterns and the prevalence of transfusion-transmitted infectious agents in recent years at the blood bank. The data comprised a total of 1500 blood donors whose information was collected from the medical records at blood bank and Component Centre, covering the period of 1 year . Samples were collected from blood bags were tested for five major infections transmitted by transfusion which included HIV , Hepatitis B virus, Hepatitis C virus, Syphilis and Malaria. 1500 Blood Donations were there, out of which 54 donors blood was tested to be positive for Blood Transmitted Infections. Prevalence of Transmission Infections was 3.6% .

**Key words:** Blood Donation, Transfusion-Transmitted Infectious

### **Introduction**

Blood Transfusion Services (BTS) are an important part of the modern healthcare system, without which efficient medical care is impossible. The aim of BTS is to provide effective blood and blood products that are safe and adequate to meet a patient's needs [1]. However, blood transfusions are associated with certain risks that can cause adverse consequences. They may cause acute complications such as haemolysis, febrile reactions, allergy, anaphylactic reactions, and delayed complications like haemolysis, carrying the risk of transmitting infections [2] Blood transfusion is an integral part of medical care and treatment. Adequate, safe and timely given transfusion saves millions of life; however, unsafe transfusion leads to many life-threatening complications and increases the possibility of transfusion-transmitted infections (TTIs)[3] . Unsafe transfusions are costly from both human and economic points of view and lead to high morbidity and mortality [4,5]. Most common TTIs are human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis and malaria. An effective donor screening protocol for donor selection, proper counselling of donor, sensitive screening tests and effective discarding techniques for reactive units can ensure a reduction in the risk of acquiring TTIs[6] . However, maintaining the safety and quality of the blood supply is of utmost importance. The risk of transfusion-transmitted infectious agents (TTIA) demands stringent precautionary measures. To ensure the safety of donated blood, comprehensive screening protocols must be employed. Donors should undergo detailed counselling and rigorous screening to assess their eligibility based on medical history, lifestyle factors, and the presence of any infectious diseases. Screening for TTIA should be carried out using both card-based and ELISA kit-based methods, as these

are reliable and effective tools for identifying potential infectious agents. The present study was conducted to find out the percentage of voluntary and replacement donors (VDs and RDs) and also, to estimate the seroprevalence of TTIs amongst VDs and RDs during period of 1 year.

## Material and methods

This study was conducted In Department Of Pathology. The data comprised a total of 1500 blood donors whose information was collected from the medical records at blood bank and Component Centre, covering the period of 1 year . The study included healthy men and non-pregnant, non-lactating women between the ages of 18 and 60 years, with a minimum weight of 45 kg and a haemoglobin level above 12.5 g/dL. Samples were collected from blood bags were tested for five major infections transmitted by transfusion which included HIV , Hepatitis B virus, Hepatitis C virus, Syphilis and Malaria. The sera were separated and analyzed based on WHO recommended testing strategies involving EnzymeLinked Immunosorbent Assay (ELISA) [7]. The ELISA was validated by the acceptance criteria laid down by the manufacturer for the absorbance of reagent blank as well mean absorbance of the positive and negative controls provided with the test kits. Known positive and negative samples were used randomly as external controls in each screening. The cut off value was calculated as per manufacturer’s directions for reporting positive and negative results. Screening for Syphilis was carried out by using one step syphilis Anti-TP Test and Malaria was screened by the Pan Antigen Card Test. All samples with reactive results were repeated in duplicate before labelling them as seropositive

## Results

**Table 1 : Blood Donations and cases of Transmitted Infections**

<b>Blood Donations</b>	
Number of Blood Donations	1500
Transmitted Infections Cases	54
Prevalence of Transmission Infections Cases	3.6%

**Table 2: Types of Blood Donars**

<b>Types of Donars</b>	<b>Number of Blood Donars n=54</b>	<b>Percentage</b>
Voluntary	49	90.74%
Replacement	5	09.25%

**Table 3 : Age groups of Blood Donars**

<b>Age groups (years)</b>	<b>Number of Blood Donars n=54</b>	<b>Percentage</b>
18-30	40	74.07 %
31-40	12	22.22 %
>40	2	3.7%

**Table 4: Blood Transfusion Transmitted Infections**

Transfusion Transmitted Infections	Number of Blood Donars n=54	Percentage
Hepatitis B Virus	27	50 %
Hepatitis C Virus	20	37 %
HIV	1	1.8 %
Syphilis VDRL	5	9.62 %
Malaria	01	1.4 %

1500 Blood Donations were there, out of which 54 donars blood was tested to be positive for Blood Transmitted Infections. Prevalence of Transmission Infections was 3.6% . 90.74% were Voluntary donars . 09.25% were replacement donars. 50 % blood donars were tested positive for Hepatitis B Virus, 37 % for Hepatitis C Virus, 1.8 % for HIV , 9.62 % for Syphilis, 1.4 % for Malaria.

## Discussion

A blood transfusion is the transfer of blood or blood products from one person (donor) into another person's bloodstream (recipient). Blood transfusion is an integral and life saving procedure of modern medicine. Transfusion of blood and its components, saves millions of lives all over the world and markedly reduces the morbidity and mortality. Disease transmission is one of the most dreaded complications of blood transfusion. The aim of any blood transfusion department is thus, to ensure safety, adequacy, accessibility as well as efficiency of blood supply at every level. A transfusion transmitted infection (TTI) is any infection identified in a recipient that is suspected to have been transmitted by blood or blood products at any point of time or any infection with the potential of being carried from person to person because of blood transfusion. Blood transfusion is an important and life-saving procedure in today's medical practice. However, it also carries the threat of various TTIs such as HIV, hepatitis B, and Hepatitis C, which can be fatal [8]. Voluntary blood donation (VBD) involves individuals donating blood willingly and selflessly to help the poor and society. On the other hand, replacement donation is done specifically in response to a patient's or their family/friends' request for blood, serving as an exchange to the blood bank [9]. The high prevalence of TTIs has increased the problems of blood safety. It is essential to continuously monitor the magnitude and trend of TTIs in blood donors. This is important for assessing the effectiveness of screening programs, which might also be directly related to the prevalence of the disease in the community. Our study shows 1500 Blood Donations were there, out of which 54 donars blood was tested to be positive for Blood Transmitted Infections. Prevalence of Transmission Infections was 3.6% . 90.74% were Voluntary donars . 09.25% were replacement donars. 50 % blood donars were tested positive for Hepatitis B Virus, 37 % for Hepatitis C Virus, 1.8 % for HIV , 9.62 % for Syphilis, 1.4 % for Malaria.

## Conclusion

Safe blood transfusion services are a cornerstone of an effective, high-quality healthcare system. However, contaminated blood transfusion is a potential source of TTIs and can be fatal instead of saving life. Thus, there is a need to increase public awareness regarding voluntary donation and its

benefits. Meticulous donor screening and use of highly sensitive techniques for detection of TTIs may help reduce the risk of TTIs.

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