Original Research Paper

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Microbiology

STUDY ON PREVALENCE OF TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG BLOOD DONORS AT OUR HOSPITAL

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ABSTRACT **Background:** Blood transfusion is a life-saving procedure that saves millions of lives every year around the world, it can be transfused as whole blood for one patient or may be manufactured into blood-derived products to be provided for more than one patient. However, it is known that blood transfusion can be associated with risks of transmitting certain infections. **Objectives Of The Study:** To find out the seroprevalence of transfusion transmissible infections among voluntary blood donors at our tertiary care hospital. **Methodology:** Blood grouping ABO and Rhesus was done by antigen antibody micro-agglutination test using commercially available standard antisera validated at National Blood Bank. Both forward (cell grouping) and reverse grouping (serum grouping) methods were used. The final blood group was confirmed only if both forward and reverse groups were identical. Donor's age, sex, location of blood donation, dates of donation and blood groups with Rh factors were tabulated in register book. HIV, HbSAg and HCV were tested by enzyme linked immuno sorbent assay (ELISA), Syphilis screening was done using Rapid Plasma Reagin card test and Malarial parasite screening was done using Rapid card test. **Results:** Out of 1862 blood donors, 1820 were males and 42 were females. 150 (8.05%) were in the age group of 18-20 years, 1230 (66.05%) were in the age group of 21-30 years, 354 (19.01%) were in the age group of 31-40 years, 108 (5.8) were in the age group of 41-50 years and 20 (1.07) were in the age group of 51-60. Majority of the blood donors were in the age group of 21-30 years representing 66.05% of the total blood donors. We estimated the prevalence the prevalence of transfusion transmitted infections among blood donors, we found the prevalence of 0.21% for HIV infections, 0.37% for Hepatitis B infections and 0.05% for Syphilis and 0.05% for malarial parasite and none of the blood donors tested positive for Hepatitis C viral infections. **Discussion And Conclusion:** In our study, we found the prevalence of 0.21% for HIV infections, 0.37% for Hepatitis B infections and 0.05% for Syphilis and 0.05% for malarial parasite and none of the blood donors tested positive for Hepatitis C viral infections. The increase in public awareness regarding voluntary blood donation, meticulous donor screening, counselling and use of highly sensitive tests can help in reducing the risk of TTIs.

KEYWORDS : transfusion transmissible infections, enzyme linked immuno sorbent assay, human immunodeficiency virus, hepatitis B virus, hepatitis C virus, malaria and syphilis.

INTRODUCTION

The main purpose of blood transfusion is protection of life, but at the same time, it can be life threatening if blood safety is not considered. The transfusion of blood and its components is one of the most essential procedures in the health care delivery in the present scenario. Transfusion transmitted infections (TTIs) can be caused by various microorganisms which may be present in the blood being transfused. The major globally prevalent TTIs are caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), ***Treponema pallidum*** and malaria parasite [1,2].

In India, it is mandatory to screen blood donors for HIV, hepatitis B, hepatitis C, syphilis and malaria. The donor screening strategies include taking the elaborate medical history, performing preliminary clinical examination and screening for infectious markers. The infectious markers include anti HIV (1 and 2) antibodies, hepatitis B surface antigen (HBsAg), anti-hepatitis C virus antibodies, and malaria antigens, such as histidine rich protein (HRP) and pan-aldolase. VDRL (venereal disease research laboratory)/RPR (rapid plasma reagin) test is done for anticardiolipin antibodies. The testing for anti-hepatitis B core antibody (HBcAb) is optional. The screening for these infectious markers is performed using rapid diagnostic tests and ELISA. Nucleic acid testing (NAT) is done at only a few centres in the country [1,2].

HIV, HBV and HCV are the causative agents of acquired immune deficiency syndrome (AIDS), hepatitis B and C infections, respectively. These infections are capable of causing long-term carrier states, prolonged viraemia and infectivity, chronic disorders along with high rates of morbidity and mortality due to chronicity, liver cirrhosis, hepatocellular carcinoma (HCC), and opportunistic infections [3-7]. These viruses can be transmitted through direct exposure to infected blood and blood derivatives, organ transplantation, haemodialysis, intravenous drug use, blood transfusion, tattooing, and sexual contact [4,6,8]. However, the later is not the common mode of HCV transmission [8,9].

The risk of transmission of these viruses through transfusion of infected blood is much higher than the other routes of transmission, mainly because of transmission of high viral load per transfusion [3]. Even if the viral load is low in the blood, the chance of infectivity is still very high [3]. However, currently blood transfusion has a relatively low contribution in the overall transmission of viral infections owing to this obligation that screening of blood donations for viral infections prior to transfusion is the highest priority [10]. The prevalence of these viral infections among blood donors varies by geography and nationality and directly depends on the prevalence of these viruses in the general population [11,12]. Globally, there are approximately 170 million individuals chronically infected with HCV, 350 million with HBV, and 38 million HIV infected people [13]. According to WHO reports, the prevalence of HBV, HCV and HIV infections among blood donors in different parts of the world varies from 0.008% to 6.08%, 0.004% to 1.96%, and 0.0004% to 2.0%, respectively [14].

Hence we have taken up this study to find out the prevalence of the transfusion transmissible infections among blood donors during the period 2019–2021, in Blood Bank, Shri Balaji Institute of Medical Sciences, Mowa, Raipur

Aim And Objectives Of The Study

To find out the seroprevalence of transfusion transmissible infections among voluntary blood donors at our tertiary care hospital.

Methodology

Source of data:

This study was conducted in the Dept. of Microbiology, Shri Balaji Institute of Medical Sciences, Mowa, Raipur

Type of study:

Cross-sectional study using the data from Blood Bank records.

Duration of study:

2 years from January 2020 to December 2021.

Data collection:

Records of 1680 voluntary blood donors were reviewed. Prior to donating blood the donors were first assessed for physical and health wellbeing. The assessment criteria required that the donors were: body weight >45 kg; hemoglobin levels, male 13.5–17.0 g/dl and female 12.5–16 g/dl and a blood pressure of up to 160/90 mmHg were accepted. Only donors who satisfied these criteria were recruited.

Analysis:

Blood grouping ABO and Rhesus was done by antigen antibody micro-agglutination test using commercially available standard antisera validated at National Blood Bank. Both forward (cell grouping) and reverse grouping (serum grouping) methods were used. The final blood group was confirmed only if both forward and reverse

groups were identical. Donor's age, sex, location of blood donation, dates of donation and blood groups with Rh factors were tabulated in register book. HIV, HbSAg and HCV were tested by enzyme linked immuno sorbent assay (ELISA), Syphilis screening was done using Rapid Plasma Reagin card test and Malarial parasite screening was done using Rapid card test.

Statistical analysis:
Data were extracted from the records and entered to Microsoft excel. Frequencies and percentages were used for the description of blood donors by gender, age groups and nationality.

RESULTS:

The present study is a retrospective observational study conducted using 2 years (January 2020 to December 2021) data from our blood bank records. Out of 1862 voluntary blood donor's males were 1820 (97.74%) and females were 42 (2.25%).

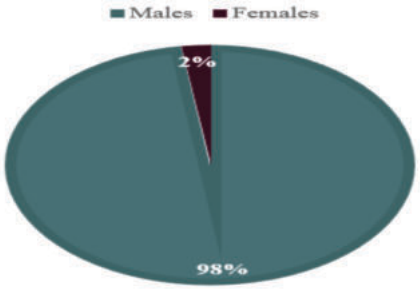

Figure 1: Shows gender wise distribution of voluntary blood donors

Table 1: Shows age wise and gender wise distribution of blood donors

Age group	Males	Females	Total
18-20 years	144	6	150
21-30 years	1212	18	1230
31-40 years	340	14	354
41-50 years	106	2	108
51-60 years	18	2	20
Total	1820	42	1862

Out of 1862 blood donors, 1820 were males and 42 were females. 150 (8.05%) were in the age group of 18-20 years, 1230 (66.05%) were in the age group of 21-30 years, 354 (19.01%) were in the age group of 31-40 years, 108 (5.8) were in the age group of 41-50 years and 20 (1.07) were in the age group of 51-60. Majority of the blood donors were in the age group of 21-30 years representing 66.05% of the total blood donors (table 1and figure 1).

Table 2: Shows frequency and percentage of transfusion transmitted infections among blood donors

Blood Group	Number	Percentage
HIV	4	0.21
HbSAg	7	0.37
HCV	0	-
VDRL	1	0.05
MP	1	0.05

This table represents the prevalence of transfusion transmitted infections among blood donors, we found the prevalence of 0.21% for HIV infections, 0.37% for Hepatitis B infections and 0.05% for Syphilis and 0.05% for malarial parasite and none of the blood donors tested positive for Hepatitis C viral infections.

DISCUSSION:

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. The prevalence of TTIs amongst blood donors in a well-structured healthcare system with good blood bank services can be used as a reliable tool for statistical estimations of these infectious agents in the general population The present study is a cross-sectional study conducted using 2 years (January 2020 to December 2021) data from our blood bank records. Out of 1862 blood donors, 1820 were males and 42 were females. 150 (8.05%) were in the age group of 18-20 years, 1230 (66.05%) were in the age group of 21-30 years, 354 (19.01%) were in the age group of 31-40 years, 108 (5.8) were in the age group of 41-50 years and 20 (1.07) were in the age group of 51-60. Majority of the blood donors were in the age group of 21-30 years representing 66.05% of the total blood donors (table 1and figure 1).

We estimated the prevalence the prevalence of transfusion transmitted infections among blood donors, we found the prevalence of 0.21% for HIV infections, 0.37% for Hepatitis B infections and 0.05% for Syphilis and 0.05% for malarial parasite and none of the blood donors tested positive for Hepatitis C viral infections.

CONCLUSION:

In our study, we found the prevalence of transfusion transmitted infections among blood donors, we found the prevalence of 0.21% for HIV infections, 0.37% for Hepatitis B infections and 0.05% for Syphilis and 0.05% for malarial parasite and none of the blood donors tested positive for Hepatitis C viral infections.

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