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Prevalence of Transfusion Transmitted Diseases in Blood Donors in Tertiary Care Centre

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ABSTRACT

Blood is an intrinsic requirement for health care and blood transfusion service is the integral part of healthcare system throughout the world. The aim of blood transfusion service should be to provide effective blood and blood products which are as safe as possible and adequate to meet patient's need. During the blood transfusion, transmission of infectious diseases through donated blood is an alarming situation and the causative agents can be virus, bacteria or protozoa. The World Health Organization (WHO) recommends all blood donations should be screened for evidence of infection prior to the release of blood and blood components for clinical or manufacturing use for the pursuit of global blood safety. After this routine serological screening implementation, the Transfusion-transmissible infections (TTIs) have been drastically reduced in many countries. To determine the seroprevalence of Transfusion Transmitted Infections (TTIs) and to evaluate trends in TTIs among blood donors The present study was carried out in Blood center, Department of Pathology, Banas Medical college and Research Institute, Palanpur from January 2021 to December 2023. A total number of 4277 donors were screened for HIV, HBV, HCV by ELISA and syphilis and malaria by rapid method. Out of 4277 donors, 100% were males. Among these 0.86 % were reactive for transfusion transmitted infection. The major infections identified were syphilis (0.56%), HBV (0.16%), HIV (0.07%), and HCV (0.07%). No donors tested positive for malaria. Seropositivity for HBV, HCV, HIV, syphilis and malaria among the healthy donors indicates the risk or chance of acquisition of these infections during blood transfusion. Implementation of donor selection criteria should be strict and proper to minimize transfusion transmitted infections and provide safer blood and blood products.

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Key Words

Blood transfusion, hepatitis, screening, seroprevalence, transfusion transmitted infections (TTI)

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INTRODUCTION

Blood transfusion service is the vital part of modern healthcare system without which efficient medical care is impossible. The aim of blood transfusion service should be to provide effective blood and blood products which are as safe as possible and adequate to meet patient's need[1]. During the blood transfusion, transmission of infectious diseases through donated blood is an alarming situation and the causative agents can be virus, bacteria or protozoa. Globally, though blood transfusion saves millions of the lives, the transfusion transmitted infections (TTI) threaten the safety of patients for blood transfusion[2,3]. Blood transfusion carries the risk of transmitting major infections such as hepatitis, HIV, syphilis and malaria[4]. The World Health Organization (WHO) recommends all blood donations should be screened for evidence of infection prior to the release of blood and blood components for clinical or manufacturing use for the pursuit of global blood safety[5,6].

Blood is one of the main sources of transmission of various pathogens. So donor selection is very important. These infections can represent as subclinical asymptomatic to life-threatening manifestations. To prevent patients from acquiring TTIs, it is blood bank's responsibility and legal obligation by doing recommended testing before issuing blood and though these testing are helpful to reduce TTIs, but not up to 100% as serological window period still poses a threat to blood safety[5,6].

MATERIALS AND METHOD

The present study was carried out in Blood center, Department of Pathology, Banas Medical college and Research Institute, Palanpur from January 2021-December 2023. A total number of 4277 donors were screened for HIV, HBV, HCV by ELISA and syphilis and malaria by rapid method.

RESULTS AND DISCUSSIONS

Table 1: Gender Distribution of Blood Donors.

Total No- 4277	Total no of donors	Percentage
Male	4277	100%
Female	0	0

Out of a total of 4277 donors, all (100%) were male, and there were no female donors, resulting in a 0% representation of females.

Table 2: Seroprevalence of TTI.

Infection	Total no of positive cases	Percentage
HbsAg	7	0.16%
Hcv	3	0.07%
Hiv	3	0.07%
Syphillis	24	0.56%
Malaria	0	0

Table 2 summarized the seroprevalence of transfusion-transmitted infections (TTI). It reported a total of 7 cases of HbsAg (0.16%), 3 cases each of HCV (0.07%) and HIV (0.07%) and 24 cases of syphilis (0.56%). No cases of malaria were detected among the tested donors.

Table 3: Distribution of TTI According to Age Group.

Age in years	HBV	HCV	HIV	Syphilis
18-30	4	1	2	8
31-40	1	2	1	8
41-50	2	0	0	6
51-60	0	0	0	2

In the age group of 18-30 years, there were 4 cases of HBV, 1 case of HCV, 2 cases of HIV and 8 cases of syphilis. For donors aged 31-40 years, there was 1 case of HBV, 2 cases of HCV, 1 case of HIV and 8 cases of syphilis. In the 41-50 years age group, there were 2 cases of HBV and 6 cases of syphilis, while no cases of HCV, HIV, or TTI were reported in the 51-60 years age group.

Blood transfusion is a lifesaving procedure and it plays an important role in the supportive care of patients. It is inevitable part of medicine. But globally, TTIs threaten the safety in recipients and the community which is of real concern. Seropositivity of HBV, HCV, HIV, syphilis and malaria among the healthy donors indicates the risk or chance of acquisition of these infections during blood transfusion. Screening for TTI ensures safe blood and blood product transfusion.

Among the donors, 100% were males in our hospital. In line with our study, Male preponderance were reported in various Indian studies. In India, Yadav[4] and Patel[5], reported the percentages of 93.1% and 98% respectively. The similar rates were observed with the studies of Kamran[2], Arshad[3], Song[7] and Bedoya[8], in other countries. Effort should be put to increase the number of female donors by various awareness programme.

In our study most of our positive donors were between 20-30 years. The same has been observed with Arshad[3], Yadav[4] and Asif[9]. The seroprevalence of TTI, was 0.86 % in our study. Slightly lower seropositivity was reported by Patel[7] (0.72%) and Fernandes[10], (0.6%). With the studies of Arshad[3] (5.8%), Yadav[4], (2.05%), Song[7] (2.67%) and Bedoya JAP[8] (3.3%), reported high prevalence compared to our study. Prevalence of these TTI varies from place to place due to variation in medical practices.

We observed 0.16% of Hepatitis B Viral (HBV) and 0.07% of Hepatitis C Viral (HCV) infections, 0.07% HIV infection and 0.56% Syphillis in our study. None of our donor showed seropositivity to malaria.

In our study, the HBV seroprevalence is 0.16%. Similar observation was made with the study of Shah[11], at Ahmedabad (0.97%). About 0.07% of donors had Hepatitis C Viral (HCV) infections in our study. Patel[5] at Gujarat, reported the similar seroprevalence of HCV (0.06%), which is concordant with our study. 0.07% donors were positive for HIV in this study, which is

similar to very low prevalence (0.08%) reported with Chandra[12], at Lucknow. In a study conducted at Chennai, only one case was detected in HIV out of 25,000 donors in the past ten years[13].

With many Indian studies, the seroprevalence of Syphilis range from 0.3-0.82%[14]. But very lower percentage of syphilis was reported by Chandra[12], (0.008%) at Lucknow, Sethi[15], (0.02%) at Uttarakhand. In our study 0.56% donors were reactive for syphilis. In India, strategies followed to prevent the transmission of transfusion transmitted malaria are (a) Donors with fever (presumably malaria) in the last 3 months. (b) To screen the donated blood for presence of malarial markers 20Inaccordance with the study of Bhagwan Singh Yadav[4], Radhiga[13] and Srikrishna[16], in our immunological screening test, all were negative for malaria. A low prevalence rate in our study may be attributed to strict screening criteria maintained in our blood bank.

CONCLUSION

To conclude, 0.86% of healthy donors are seropositive for TTI in this study and reveal the danger of transmitting through blood transfusion. Syphillis is the commonest TTI among apparently healthy blood donors, which is followed by HBV. Implementation of donor selection criteria should be strict and proper. To minimize transfusion transmitted infections and provide safer blood and blood products, highly generation kits and newer strategies are to be adopted.

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