

Analysis of the seroprevalence of HIV, HBsAg and HCV infections among blood donors – Three year study

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Abstract

Aims: Blood transfusion is an important mode of transmission of infections to recipients. The aim of the study was to analyse the seroprevalence of HIV, HBsAg, and HCV in the blood donors.

Materials and Methods: All donors who attended the blood bank of Siddhartha Medical College, Vijayawada over a period of three years (January 2014 to December 2016) have been studied. The donor data was documented for each case including the seropositivity for HIV, HBsAg and HCV. A total of 9412 blood units collected from the donors were tested for HIV, HBsAg and HCV.

Results: The seroprevalence of HIV, HBsAg, and HCV was 0.36%, 0.91% and 0% respectively among total blood donors.

Conclusion: The seroprevalence of HBsAg was more compared to HIV and none of the donor was positive for HCV.

Keywords: Transfusion, transmissible, seroprevalence, HIV, HBsAg, HCV

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I. Introduction

Transmission of infectious diseases through donated blood is of concern in order to provide blood with safety precautions for transfusion. Blood transfusion carries the risk of transfusion induced transmissible infections including HIV, hepatitis, syphilis, malaria etc., and some viral infections like Epstein-Barr virus, cytomegalovirus and herpes [1]. Clerical errors like release of unsuitable units of blood, accidental transfusion of autologous blood to another recipient (autologous blood may include infectious diseases) and errors in testing also contribute to transfusion induced transmission of harmful agents.[2]. The aim of the present study was to analyse the seroprevalence of HIV, HBV and HCV and to assess the level of blood safety.

II. Materials And Methods

This study was carried out retrospectively among the donors attended the blood bank of Siddhartha Medical College, Vijayawada. The data was collected from donor registers including the serological diagnosis. The seroprevalence was assessed for HIV, HBsAg and HCV infections.

All donors including the voluntary as well as replacement donors attended the blood bank of Siddhartha Medical College, Vijayawada during the period of three years (January 2014 – December 2016) were included in this study. The donors with clinical history of hepatitis and chronic infections were excluded from this study. Clinical data was documented for each case which included Hemoglobin more than 12 gm% for both male and female, weight more than 50 kg. A total of 9412 units of blood were screened for HIV, HBsAg and HCV by using various National AIDS Control Organization (NACO) approved ELISA kits. All the reactive samples were retested to confirm before labelling them seropositive and the respective units were discarded.

III. Results

A total of 9412 blood units were collected during a period of 3 years (January 2014 to December 2016) from both voluntary donors as well as relative/ replacement donors. Number of blood units collected per year was shown in Table 1. Seropositivity for HIV, HBsAg and HCV were shown in Table 2. Yearwise distribution of HIV, HBsAg and HCV positivity was shown in Table 3. The seropositivity of HIV and HBsAg were 34 (0.36%) and 86 (0.91%) respectively, whereas the seropositivity of HCV was 0%.

Table 1: Number of blood units collected during three years.

Year	Total number of blood units collected	Percentage
2014	2108	22.4%
2015	2927	31.1%
2016	4377	46.5%
TOTAL	9412	100%

Table 2: Total seropositivity among donors

Total no. of blood units collected from donors	Total number of positive cases		Total seropositivity
	HIV	HBsAg	
9412	34 (0.36%)	86 (0.91%)	1.27%

Table 3: Yearwise distribution of seropositivity of HIV, HBsAg & HCV

Year	Total no. of blood units collected	HIV positive	HBsAg Positive	HCV positive
2014	2108	9 (0.42%)	27 (1.28%)	-
2015	2927	6 (0.2%)	32 (1.09%)	-
2016	4377	19 (0.43%)	27 (1.32%)	-

IV. Discussion

Blood transfusion is a potentially significant route of transmission of infection although risk may be reduced by vigorous screening of donors and donated blood. Incurrence rate of HIV through blood transfusion approach 100% [1]. Recent studies in the west have shown that the estimated incidence of transfusion induced transmitted HIV, HBsAg & HCV is very low [3]. In the present study the incidence of HIV was 0.36%, HBsAg was 0.91% and HCV was 0%. The overall the incidence of infection was 1.27%.

This study highlights 0.36% prevalence of HIV infection. Seropositivity of HIV in other studies was observed to be 0.5% [3], 0.3% [1], and 0% [4]. Karnataka state AIDS prevention society data also states 0.5% incidence of HIV in Karnataka [5].

Seroprevalence of HBsAg in this study was 0.91% and in various other studies was 2.9% [3], 1.7% [1] and 6% [7]. The frequency of HBsAg is more than other infectious diseases because of asymptomatic carriers. The frequency of HIV is less compared to HBsAg. Moreover, it should never be forgotten that blood donations collected in the latent period of infection may be infectious despite a negative antibody test [8]. Adding nucleic acid testing (NAT) to routine blood screening protocol helps in detecting very low levels of viral RNA or DNA that may be present in the donated blood.

The prevalence of seropositivity for HCV was 0%. But in other study the seroprevalence of HCV was 2.3% [6,8]. The long term risk of developing cirrhosis and hepatocellular carcinoma is greater in HCV than HBsAg positive patients. Relative donors most of the times are family members and during emergency they donate blood without giving proper history of exposure.

Thus implementing strategies to fight against transfusion-transmissible infections is mandatory especially HIV, HBs Ag as well as HCV. Motivation of voluntary blood donors by conducting voluntary blood donation camp is the most effective way of ensuring adequate supplies of safe blood on a continuing basis. Introducing nucleic acid testing (NAT) for HIV, HBsAg and HCV is recommended to detect the infection during window period.

V. Conclusion

Seroprevalence of HBsAg was more as compared to HIV among blood donors. Educating people, creating awareness, encouraging voluntary blood donation camps through various organizations and implementing strict donor selection criteria as per the guidelines laid down for blood bank by National AIDS Control Organisation are the important factors to reduce the transmission of transfusion transmissible infections.

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