

A Study of Prevalence of HIV and Hepatitis B among Blood Donors in Tertiary Care Hospital, Kolar, Karnataka

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ABSTRACT

Background: Blood transfusion is usually lifesaving but can cause disease if not tested properly for the presence of micro-organisms before transfusion. Most common diseases transmitted through blood are hepatitis, HIV, syphilis, malaria, Hepatitis B, and Hepatitis C. The present study was undertaken to assess seroprevalence and trends of HIV and HBV (Hepatitis B Virus) in our rural tertiary health care hospital.

Methods: All the blood donors (voluntary donor's and replacement donors) donating blood in the blood bank were considered as the study population. During the study period 79162 units were collected from the healthy donor's aged between 18 to 60 years.

Results: A total of 35 938 donors were screened for HIV and HBsAg over a period of 5 years of these, 33,853 (94.2%) donors were males and 2085 (05.8%) were females. 117 donor samples were positive for HIV (0.30%) and 359 donor samples were positive for HBsAg accounting to 0.99% of seroprevalence.

Conclusion: Seroprevalence of HIV was 0.30% and HBV 0.99%. There was a gradual declining trend in both HIV and Hepatitis B. Strict selection of blood donors and following NACO approved standard testing procedures and having a quality control for each test has helped to reduce seroprevalence of HIV and Hepatitis B.

Keywords: Seroprevalence; Blood donors; Hepatitis B; HIV

INTRODUCTION

Blood transfusion is usually lifesaving but can cause disease if not tested properly for the presence of micro-organisms before transfusion. Most common diseases transmitted through blood are hepatitis, HIV, syphilis, malaria, Hepatitis B, and Hepatitis C [1-4].

Prevalence of HBs Ag (Hepatitis B surface antigen) varies from 1 to 13%, with an average of 4.7% [5]. Hepatitis B is highly infectious and is transmitted through all blood components and most of the blood derivatives [6]. the use of unscreened HBV-infected blood and blood products will result in the transmission of HBV in the majority of cases. In general, if an individual infects with virus in his earlier life, the more likely the individual is to develop chronic infection which then has a higher probability of progressing to cirrhosis and hepatocellular carcinoma [7,1].

HIV prevalence in India is estimated at 0.22% (0.16% - 0.30%) with 0.25 % (0.18-0.34) among males and 0.19% (0.14-0.25) among Females. As HIV can be present in the bloodstream in

high concentrations and is stable at the temperatures at which blood and individual blood components are stored, the virus may be present in any donated blood from an HIV-infected individual. Infectivity estimates for the transfusion of infected blood products are much higher (around 95%) than for other modes of HIV transmission owing to the much larger viral dose per exposure than for other routes [1].

The present study was undertaken to assess seroprevalence and trends of HIV and HBV (Hepatitis B Virus) in our rural tertiary health care hospital which reflect the apparent as well as hidden load in the population as blood donors are usually healthy members of the society.

METHODS

After taking institutional ethical clearance, five years retrospective study was carried out at blood bank. All the blood donors (voluntary donor's and replacement donors) donating blood in the blood bank were considered as the study population. During the

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Table 1: Total number of donors and seroprevalence of HIV and HBsAg over a period of five years.

Year	Number of donors	HIV (%)	HBs Ag (%)
2013	7293	0.35	0.82
2014	7622	0.4	0.78
2015	8685	0.4	1.25
2016	5495	0.21	1.2
2017	6843	0.17	0.9
Total	35938	0.30% (Avg)	0.99% (Avg)

study period 79162 units were collected from the healthy donor's aged between 18 to 60 years.

Written consent from the donor were also taken prior to blood donation. 3ml of blood in plain vial and 2ml blood in EDTA vial taken from the satellite bag. The units were tested for transfusion transmitted diseases.

Donor selection was based on NACO (NATIONAL AID CONTROL ORGANIZATION), a unique identification number was given, and clinical history was collected. Any pre-existing illness in the recent past, weight loss, recent jaundice, liver disease, cardiovascular disease, pulmonary disease, epilepsy, malaria, excessive bleeding and recent donation of blood were excluded from the study.

Persons belonging to high risk groups such as patients from Thalassemia, sexually transmitted diseases, drug abusers, dialysis patients, and pregnant women were also excluded from the study as they were not able to donate. Weight, pulse, blood pressure and temperature were recorded for each donor. Screening for anemia and inspection for any marks of the drug abuse or any skin lesions / infections at the venipuncture site was also recorded.

The samples were obtained for serological testing. Screening for HBs Ag and HIV was done using rapid kit based on the principle of a one-step immunoassay. All reactive samples were tested again using the commercially available ELISA KIT with reported sensitivity of 100% and specificity of 94.9 % per the manufacture's manual. Samples showing repeat test reactivity on both methods were considered positive and were included for calculation of seroprevalence. Standard operative procedures were strictly followed. Quality control was run for all the serological tests. Blood bank quality was ensured by well trained professionals.

RESULTS

A total of 35 938 donors were screened for HIV and HBsAg over a period of 5 years (table 1). Of these, 33.853 (94.2%) donors were males and 2085 (05.8%) were females. 117 donor samples were positive for HIV (0.30%) and 359 donor samples were positive for HBsAg accounting to 0.99% of seroprevalence (Table 1).

Of the donors tested positive for HIV by ELISA, 97% were males and 3% were females. A high rate of HIV positivity 71.79% (84/117) was seen in the age group of 18-35 years. The remaining 28.20% (33/117) were in the age category of 36-60 years.

Of the donors tested positive for HBsAg, 91% were males and 9% were females. A high rate of HBsAg positivity 70.75% (254/359) was seen in the age group of 18-35 years. The remaining 29.24% (105/359) were in the age category 36-60 years.

DISCUSSION

Blood transfusion is a life saving measure but still has a risk of transmission of infections. Screening tests done during blood transfusion gives a clue about rate of prevalence of transfusion transmitted diseases in asymptomatic individuals [8] Knowledge of the prevalence of the transfusion transmitted infections among blood donors will help to develop and implement efficient strategies for safe blood transfusions [9-11].

In this study, the prevalence of HIV was 0.30%. The rate of prevalence has reduced gradually from 0.4 to 0.17% (2013 to 2017). Highest prevalence was seen in 2014 and 2015. The maximum number of donors was in 3rd decade, higher in men than in women. This reduce prevalence may be because of meticulous donor selection. HIV seroprevalance of present study was comparatively less than studies done by d Dayal S [12], Chandra et al [13], Devraj et a. [14] and Armed force study [7]. In Western studies done on seroprevalance of HIV, the prevalence of HIV is high varies from 15% to 3% [15-17].

HBV is considered one of the most infectious diseases in the world and it is more prevalent in Sub Saharan Africa and Asia. In the present study, the prevalence of HBV among blood donors was 0.99%. Highest prevalence was seen in 2015 (1.25%) and lowest in 2017 (0.9%). Maximum numbers of HBV positive donors were in 3rd decade, higher in men than in women. This low rate seroprevalance may be due to awareness of transfusion transmitted diseases among blood donors and comprehensive vaccination program against HBV, and improved clinical selection of donor. Present study prevalence was comparatively lower than studies done by Gupta et al. [17] and Varsha GS et al [4]. In contrast, prevalence of HBV in other similar studies was high, varied from 25% to 1.6% [6,17,18].

CONCLUSION

Seroprevalance of HIV was 0.30% and HBV 0.99%. There was a gradual declining trend in both HIV and Hepatitis B. strict selection of blood donors and following NACO approved standard testing procedures will further help in decline of seroprevalance of HIV and Hepatitis B.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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