

Analysis of the seroprevalence of HIV, HBsAg, HCV and syphilitic infections detected in the pretransfusion blood: A short report

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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, HCV and syphilitic infections in the pretransfusion blood. **Methods:** A total of 19,135 blood units were tested for HIV, HBsAg, HCV and syphilis. **Results:** The seroprevalence of HIV, HBsAg, HCV and syphilis was 0.9%, 3.2%, 0.35%, 0.04% respectively in total donors. **Conclusion:** The seroprevalence of HBsAg was more compared to HIV, HCV and syphilis.

Keywords: Transfusion transmissible, Seroprevalence, Pretransfusion

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INTRODUCTION

Transmission of infectious diseases through donated blood is of concern in order to provide safe blood for transfusion which forms an integral part of medical and surgical therapy. Blood transfusion carries the risk of transfusion induced transmissible infections including HIV, hepatitis, syphilis, malaria and less frequently toxoplasmosis, brucellosis and some viral infections like Epstein-Barr virus, cytomegalovirus and herpes [1]. Clerical errors also contribute to transfusion induced transmission of harmful agents. These types of errors include the release of unsuitable units of blood, accidental transfusion of autologous blood to another recipient (autologous blood may include infectious diseases) and errors in testing [2].

The aim of the present study was to analyse the seroprevalence of HIV, HBV, HCV, syphilis and assess the level of blood safety.

MATERIALS AND METHODS

The present study was conducted at the Blood Bank, Medical college hospital, during the period January 2005 to December 2009. The inclusion criteria were: Hb more than 12 gm% for both male and female, weight more than 50 kg for whole blood and more than 60 kgs for component preparation with no history of hepatitis, chronic infections or high risk behaviour. A total of 19,135 units of blood were screened for HBsAg, HIV (1 & 2) and HCV by using various National AIDS control organization (NACO) approved ELISA kits. Screening for syphilis was done by Rapid plasma reagin method. All the reactive samples were retested to confirm before labeling them seropositive and the respective units were discarded.

RESULTS

Out of 19,135 blood donors 11,165 (58%) were voluntary donors and 7970 (42%) were relative/replacement donors (Table 1). Sixty-three percent of the donors were in the age group of 21-30 years. The results of seropositive samples for HIV, HBsAg, HCV and VDRL are shown in Table 2. The rate of co infection with HIV and HBsAg was 0.06% (12 cases), HIV with HBsAg and HCV was 0.03% (6 cases), HIV with syphilis and HBsAg with HCV was nil.

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

Year	Units Collected	Voluntary Donor	Relative/ Replacement Donor
2005	3177	2050	1127
2006	3571	2162	1409
2007	3139	1676	1463
2008	4174	2051	2123
2009	5074	3226	1848
Total	19,135	11,165 (58%)	7970(42%)

Table 2: Results of seropositive donor blood samples for HBsAg, HIV, HCV and syphilis.

Year	2005	2006	2007	2008	2009	Total
Total Units	3177	3571	3139	4174	5074	19,135
HIV positive	17 (0.5%)	33 (0.9%)	38 (1.2%)	38 (0.9%)	49 (0.9%)	175 (0.91%)
HBsAg positive	116 (3.6%)	105 (2.9%)	119 (3.7%)	220 (5.2%)	71 (1.3%)	631 (3.28%)
HCV positive	24 (0.7%)	7 (0.1%)	18 (0.5%)	17 (0.4%)	02 (0.03%)	68 (0.35%)
VDRL positive	5 (0.15%)	4 (0.1%)	-	-	-	9 (0.04%)

Total positive cases = 883 (4.58%)

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 0.91%, HBsAg 3.2%, HCV 0.35%, syphilis 0.04% and overall the incidence of infection was 4.58%.

This study highlights 0.91% 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 3.2% and in various other studies was 2.9% [3], 1.7% [1] and 5% [2]. Seroprevalence of HBsAg in Bombay was 6% and 5% in Pakistan [7, 2]. 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 and VDRL was 0.35% and 0.04% respectively. Other study also showed 0.5% and 0.23% prevalence respectively [6]. HCV is transmitted primarily through blood exposure. About 20-40% of HCV cases are acute and majority of them progress to chronic infection. The long term risk of developing cirrhosis and hepatocellular carcinoma is greater in HCV than HBsAg positive patients [3]. Indian studies indicate that seroprevalence of HCV ranges between 0.4-1.09% [6].

Majority of the donors (98%) were male which is comparable to the study done by Rao, et al., Annapurna et al. [9] and Arora et al. [1].

In the present study, no voluntary donor was found to be positive for HIV. The seroprevalence of other infectious diseases is more in relative donors than voluntary donors. Relative donors most of the times are family members and during emergency they donate blood without giving proper history of exposure.

Today we know that all the countries are joining hands to fight against transfusion-transmissible infections, especially HIV. 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 is an important factor.

CONCLUSION

In five year period 19,135 units of blood was collected. Seroprevalence of HIV was 0.91%. the seroprevalence of HBsAg, HCV and syphilis was 3.2%, 0.35% and 0.04% respectively. The seroprevalence was more in relative/replacement donors as compared to voluntary donors. No voluntary donor was found to be positive for HIV. The present study concludes that motivating 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.

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Author Contributions

Nagarekha Kulkarni – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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REFERENCES

1. Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. *Indian J Pathol Microbiol* 2010;53(2):308–9.
2. Tulika Chandra, Ashutosh Kumar, Ashish Gupta. Prevalence of transfusion transmitted infections in blood donors: an Indian experience. *Tropical Doctor* 2009;39(3):152–4.
3. Nilima Sawke, Sawke GK, Chawla. Seroprevalence of common transfusion – Transmitted infections among blood donors. *People's journal of scientific research* 2010;3(1):5–7.
4. Syed Abdul Mujeeb, Khalid Mehmood. Prevalence of HBV, HCV and HIV infections among family blood donors. *Annals of Saudi Medicine* 1996;16(6):702–3.
5. Balakrishna. Paper presentation of HIV status in Karnataka at MVJ Medical College and Research Hospital Bangalore on 26th July, 2008.
6. Ahmed MV, Begum HA, Hossain T, Chakraborty P. Incidence of common transfusion transmitted diseases among blood donors. *JAFMC Bangladesh* 2009;5(1):4–6.
7. Rahman K, Khan AA, Haider Z, et al. Prevalence of seromarkers of HBV and HCV in health care personnel and apparently healthy blood donors. *J Pak Med Assoc* 1996;46:152–4.
8. Cumming PD, Wallace EL, Schoor JB, Dedd RY. Exposure of patients to HIV through the transfusion of blood components that test antibody negative. *N Engl J Med* 1989;321:941–6.
9. Rao P, Annapurna K, HIV status of blood donors

and patients admitted in KEM Hospital Pune. *Indian J Hemat Blood Transf* 1994;12:174–6.