

Seroprevalence of Co-Infections Among Blood Donors in A Blood Bank of A Tertiary Health Care Centre

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ABSTRACT

Introduction: Transfusion transmissible infections (TTIs) like HIV, HBV, HCV, syphilis and malaria are major problems associated with blood transfusion practices. Because of shared modes of transmission, co-infection with HIV, HBV and HCV is a significant occurrence, particularly in areas where these viruses are endemic and even amongst apparently healthy subjects like blood donors. Hence the study was undertaken to analyze the prevalence and patterns of co-infections among voluntary and replacement donors in our geographical area

Methods: The present study was carried out in Blood bank of S.N Medical College, Bagalkot from July 2012 to June 2013. Two ml of blood sample was collected in labeled pilot tube at the time of collection of blood from donor tubing of blood bag. Serum was separated. The samples were tested for HIV, HBV, HCV, Malaria and Syphilis.

Results: Out of the 8187 blood donors, 7461 (91.13%) were replacement donors and remaining 726 (8.87%) were voluntary donors. Co infection was seen in 8 (0.09%) donors.

Conclusion: Co infections are more common among replacement donors. Since co infected individuals are at greater risk of hepatotoxicity following treatment with antiviral drugs, care should be taken to detect all infections among otherwise healthy donors.

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Introduction

Transfusion transmissible infections (TTIs) like HIV, HBV, HCV, syphilis and malaria are major problems associated with blood transfusion practices. Transfusion of blood and blood products, although being a life saving measure, still has far reaching consequences as far as the morbidity and mortality resulting from the transfusion of infected blood is concerned. With every unit of blood, there is 1% chance of TTIs.^[1]

Because of shared modes of transmission, co-infection with HIV, HBV and HCV is a significant occurrence, particularly in areas where these viruses are endemic and even amongst apparently healthy subjects like blood donors.^[2] WHO recommends an integrated strategy to improve blood transfusion safety by establishment of well organized blood transfusion services, blood collection from voluntary non-remunerated donors, screening of blood for at least four major TTIs with quality assured system and rational use of blood.^[3] As per National AIDS Control Organization (NACO), 3.5% of HIV infection is attributed to blood transfusion.^[4] Although there are many studies on prevalence of TTIs in blood donors, data on the presence of co-infection with more than one TTIs is sparse.^[5,6] Hence the study was undertaken to analyze the prevalence and patterns of co-infections among voluntary and replacement donors in our geographical area.

Material and Methods

The present observational study was carried out in Blood bank of S.N Medical College, Bagalkot from July 2012 to June 2013. The study was approved by institutional ethical committee. The blood bank of department of pathology, S.N Medical College is licenced blood bank with average annual collection of 8000 units of blood from healthy blood donors from in and around Bagalkot annually.

Inclusion criteria: Any donor meeting all criteria's for eligibility of blood donation as mentioned in SOP, Blood Bank, S. N .Medical College, Bagalkot.

Exclusion criteria: Any eligible donor having any kind of reaction during the blood donation procedure was excluded from the study.

Sample collection: Two ml of blood sample was collected in labeled pilot tube at the time of collection of blood from donor tubing of blood bag. The sample was centrifuged at 3500 rpm for 5 minutes to obtain clear non hemolyzed serum.

The samples were tested for HIV, HBV, HCV, Malaria and Syphilis. Screening test for HIV was done by rapid test – HIV tridot. (manufactured by – Diagnostic enterprises, HP,

India) and confirmed by MICROLISA- HIV Ag–Ab Elisa kit (J Mitra and Co. PVT. LTD. New Delhi, India.)

Screening Test for Hepatitis B was done by HEPACARD (J Mitra and Co. PVT. LTD. New Delhi. India.) and confirmed by HEPaelisa (J Mitra and Co. PVT. LTD. New Delhi, India.)

Screening test for HCV was done by rapid test –HCV tridot. (Diagnostic enterprises, HP,India) and confirmed by HCV – MICROELISA. (J Mitra and Co. PVT. LTD. New Delhi, India.)

Test for malaria was done by rapid antigen detection test-PAN MALARIA CARD (J Mitra and Co. PVT. LTD. New Delhi, India.), which is a visual, rapid and sensitive immunoassay for the qualitative diagnosis of infection with all four Plasmodium Species (P. falciparum/P. vivax/ P. malariae/P. ovale) in human whole blood .

Test for Syphilis was done by rapid test- RPR test by carbogen kit(Tulip diagnostics PVT LTD, India) along with positive and negative controls.

Those with combination of ≥ 2 TTIs were labeled as co-infection.

RESULTS:

Table-1 shows, type of blood donors. Out of the 8187 blood donors, 7461 (91.13%) were replacement donors and remaining 726 (8.87%) were voluntary donors.

In the present study HIV reactivity was seen in 32 (0.39%) of donors. Similarly 238 (2.9%) were positive for HBV infection, 17 (0.20%) were positive for HCV infection, 4 (0.04%) were positive for syphilis infection, 4 (0.04%) were positive for malaria infection. Table-2 shows, co infection among donors.

Table-1: Showing Type of blood donors

Type of donor	No. of screened blood units	Percentage
Voluntary	726	8.87%
Replacement	7461	91.13%
Total	8187	100%

Table- 2: Co infection among donors

Co-infection	Voluntary donors	Replacement donors
HIV+Syphilis	0	1 (0.012%)
HIV+HBV	0	1 (0.012%)
HBV+ Syphilis	0	3 (0.036%)
HBV+Malaria	0	3 (0.036%)
Total	0	8 (0.09%)

Co infection was seen in 8 (0.09%) donors. HIV and syphilis co infection was seen in 1(0.012%) donor. HIV and HBV co infection was seen in 1(0.012%) donor. HBV and syphilis co infection was seen in 3(0.036%) donors. HBV and malaria co infection was seen in 3(0.036%) donors. No HIV and HCV, HBV and HCV co infections were seen in the present study.

Discussion

TTI's continue to be a great threat to safe transfusion practices. Many factors favor co infection including high degree of epidemiological similarity between their mode of transmission.

Worldwide, HBV accounts for an estimated 370 million chronic infections, HCV for an estimated 130 million, and HIV for an estimated 40 million cases. In HIV infected persons an estimated 2-4 million have chronic HBV infection and 4-5 million have HCV co infection.^[7] Syphilis being a sexually transmitted disease, its presence points towards indulgence in high risk behavior and consequently higher risk of exposure to infections like HIV, HBV and HCV.^[8]

Majority of donors in the present study were replacement donors (91.13%). The finding is in concordance with other studies.^[9,10,11] Very few studies have been conducted in India on co infection among blood donors. In the present study co infection was seen in 8 (0.09%) donors. Similar to present study co infection was seen in 0.02% donors in Charan S.K. study^[12] and 0.05% donors in Kaur G et al study.^[13]

In the present study all the co infection donors were replacement donors, which is similar to Dorgam et al^[14] and Kaur G study^[13] who found co infection more among replacement donors.

This finding is in agreement with World Health Organization suggestion that, commercially remunerated donors and family replacement donors are more likely to transmit TTIs than voluntary donors.^[15] A person in need of money is more likely to conceal his/her true state of health.

Kapur and Mittal have reported, among HIV positive donors, HBV positivity in 12.2% and Syphilis reactivity in 11.8%.^[16] Dorga M et al have reported, among HIV seropositive donors, there was one(16.66%) sero reactive case for HCV.^[14] Jain et al estimated the seroprevalance of hepatitis virus in patients infected with HIV and found that 9.9% of patients were HBs Ag positive, 6.3% were HCV positive and 1% had dual infection with HCV &HBV.^[17]

In the present study, no HCV co infections were seen but Dorga S et al^[18] have reported maximum number (34.2%)

of HIV and HCV co infections and 11.4% HIV and HBV co infections among blood donors.

HIV and HBV co infection is reported in 0.8% by Mercy KA et al,^[19] in 0.4% by Egah et al^[20] and in 0.5% by Oladele et al.^[21] HIV, HBV and syphilis co infection was seen in 2.8% of co infection patients by Dorga S et al.^[18]

Among four syphilis cases in the present study, 3 were co infected with HBV and one with HIV which could be because, syphilis can increase the susceptibility to other sexually transmitted diseases.

TTIs can be reduced by proper donor screening. In resource limited settings testing for most common infection in that geographical area should be done first followed by other common infections so that if one test turns out to be positive, other tests can be omitted and tests should be carried out before collection of blood on 2ml sample blood, so that collection of infected blood and wastage of blood bags can be minimized.

To conclude co infections are more common among replacement donors which could be due to concealing of high risk behavior and paid donors posing as relatives. Promotion of voluntary donors would reduce the risk of TTIs. Since co infected individuals are at greater risk of hepatotoxicity following treatment with antiviral drugs, care should be taken to detect all infections among otherwise healthy donors.

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