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Original Research Article

Assessment of prevalence of sexually transmissible infections among voluntary blood donors and its comparison with replacement donors at Hassan Institute of Medical Science, Hassan, Karnataka, India

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ABSTRACT

Background: Hepatitis B virus, Hepatitis C virus and Human immunodeficiency virus (HIV) are important STDs which can be transmissible to the recipients of blood transfusion. The aim of the present study is to study the seroprevalence of HIV, HBV and HCV infection in the blood among voluntary and replacement donors in HIMS Hassan during 2010 to 2012.
Methods: A retrospective study was conducted at blood bank of HIMS, Hassan for the years 2010 to 2012. The donors with Hemoglobin>12gm% for both sexes, weight >50 kg, no history of chronic illness, hepatitis, high risk behaviours were included in the study. All the blood samples collected were screened for HIV, HBV and HCV using ELISA kits. All the blood samples were sent to NACO (national AIDS control organization) and subjected to NAT (nucleic acid test) for detection of antigens. Results compared for both voluntary and replacement donors.
Results: Total of 10938 blood donors screened. Majority of the donors were males 95.8% (10484) and belonged to voluntary group 72.8% (7971). The total prevalence of STDS were 0.61% (67). The prevalence of HBV, HCV and HIV was 0.47% (51), 0.04% (4) and 0.11% (12) respectively. Prevalence of STDs was higher among voluntary donors 0.57% (62) compared to replacement donors 0.05 % (5). Statistically significant difference was observed in HBV prevalence in voluntary and replacement donors.
Conclusions: Most common STDs in blood donors was HBV followed by HIV and HCV. STDs were mainly seen in voluntary donors compared to replacement donors. Majority of the donors were males.

Keywords: Human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Replacement donors, Voluntary donors

INTRODUCTION

Blood transfusion is a core service within health care system and individuals who donate their blood provide a unique contribution to health and survival of others.

Blood transfusion can transmit infectious diseases which can be fatal.[1] Evaluation of data on the prevalence of transfusion of STDs namely HIV, HBV and HCV among the blood donors gives the occurrence of infections in blood donor population and consequently the safety of the collected donor bloods. It also gives an idea of the epidemiology of these diseases in the community.

Transfusion associated infections continue to be a dangerous problem.[2] Transfusion transmissible infections can be viral, bacterial and parasitic infections. The most common transfusion infections are of viral origin.[3]

Majority of post transfusion diseases have been caused by hepatitis B (HBV), Human immunodeficiency virus (HIV) and hepatitis C virus (HCV).[3]

Evaluating the prevalence of transfusion transmissible infections namely HBV, HIV and HCV among blood donors can give the incidence of unnoticeable infections in healthy looking donors and give us valuable data in formulating strategies for improving the management of a safe blood transfusion. It also gives the magnitude of sexually transmitted infections in the community.[4,5]

Voluntary blood donors refer to "a person who gives blood, plasma or other blood components on his/her own will and receives no payment for either in the form of cash or in any kind which could be considered as substitute for money". Replacement donor refers to "donor who gives blood when it is required by a family member of the patient's family or community. This may involve a hidden paid donation system in which the donor is paid by the patient's family".[6]

This study was conducted with objective to determine the prevalence of HBV, HIV and HCV infections among blood donors in HIMS, Hassan. The statistics and the data obtained can be further extrapolated to compare with global burden.

METHODS

A retrospective hospital record-based study was conducted at blood bank of HIMS Hassan with prior clearance taken from the Institute Ethical and Research committee and blood bank officer. Voluntary and replacement donors satisfying the inclusion criteria were included in the study.

Inclusion criteria

- Age >18 years and <65 years
- Hemoglobin >12gm/dl for both sexes
- Weight >50 kgs
- No history of chronic illness, hepatitis, high risk behaviours.

All blood samples of donors were screened for HBV, HIV and HCV using approved ELISA kits. All blood samples were sent to NACO (national AIDS control organization) and subjected to NAT (nucleic acid test) for detection of antigens.

All positive blood donor samples were retested before labeling them as seropositive and discarded. Results analyzed and compared among voluntary and replacement donors. Analysis of three years data was done using Chi square test and compared among Voluntary and Replacement donors.

RESULTS

Total of 10938 blood donors were screened. Majority of the donors were males 95.8% (10484) only 454 were female donors. Majority of the donors belonged to voluntary group 72.8% (7971). There was increasing trend observed for replacement donors as only 786 were replacement donors in 2010,659 and 1525 were for the years 2011 and 2012 (Table1).

Table 1: Year wise voluntary and replacement and sex distribution.

Year	Total	Voluntary	Replacement	Male	Female
2010	3611	2825	786	3480	131
2011	3167	2508	659	3036	131
2012	4160	2637	1525	3968	192
Total	10938	7970	2968	10484	454

Table 2: Overall seropositivity and prevalence of HBV, HIV and HCV.

Seropositivity	2010	2011	2012	Total
Total	3611	3167	4160	10938
HIV	05 (0.14%)	03 (0.09%)	04 (0.09%)	12 (0.11%)
HBV	18 (0.56%)	17 (0.54%)	16 (0.38%)	51 (0.47%)
HCV	00	01 (0.03%)	03 (0.07%)	04 (0.04%)
Total positive	23	21	23	67

Over all prevalence of STDS was 0.61% (67). The prevalence of HBV, HCV and HIV was 0.47% (51), 0.04% (4) and0.11% (12) respectively. In the year 2010 HBV was found in 18 donors, no HCV cases detected in 2010, HIV was fond in 5 donors. In 2011 17 donors were positive for HBV, 1 donor positive for HCV and 3 donors positive for HIV. For the year 2012 16 donors were positive for HBV, 3 donors positive for HCV and 4

donors positive for HIV (Table 2). Prevalence of STDs was higher among voluntary donors 0.57% (62) compared to replacement donors 0.05 % (5). Statistically significant difference was observed in HBV prevalence in voluntary and replacement donors (p value 0.02).

Table 3: HIV positivity in voluntary and replacement donors.

HIV status	Voluntary	Replacement	Total
Positive	10 (0.12%)	02 (0.07%)	12 (0.11%)
Negative	7960	2966	10926
Total	7970	2968	10938

HIV prevalence was seen in 12 donors (0.11%), of which 10(0.09%) were from voluntary donors and 2(0.018%) from replacement donors (Table 3). There was a decreasing trend in prevalence of HIV compared to 2010, 2011 and 2012 showed less HIV positive seroprevalance (Table 2).

Table 4: HBV positivity in voluntary and replacement donors.

HBV status	Voluntary	Replacement	Total
Positive	48 (0.60%)	03 (0.10%)	51 (0.47%)
Negative	7922	2965	10887
Total	7970	2968	10938

HBV prevalence was seen in 51 donors (0.47%), of which 48 (0.44%) were voluntary donors and 3 (0.02%) were replacement donors (Table 4). Again, there was decreasing trend in seroprevalance of HBV as observed for HIV in present study (Table 2). HCV prevalence was seen in 4 donors (0.04%), all were from voluntary donors (Table 5). There was increasing trend in seroprevalance of HCV as there were no positive cases in 2010, 1 positive case in 2011, 3 positive cases in 2012 (Table 2).

Table 5: HCV Positivity in voluntary and replacement donors.

HCV Status	Voluntary	Replacement	Total
Positive	04 (0.05%)	00	04 (0.04%)
Negative	7966	2968	10934
Total	7970	2968	10938

DISCUSSION

At present era blood transfusion is a lifesaving procedure. Blood is a precious and lifesaving resource. However, it requires an adequate supply of safe blood. The blood transfusion is an effective mode of transmission of STDs, as it allows large quantum of infective virions into the recipient. Pre-donation clinical screening of donors to reject or defer the risky group from donation is an important step. But many of the donors are not detected during pre-donation clinical screening if the persons are in window period of the disease or in convalescent phase or asymptomatic cases or carriers.[7] More than one third of the population has been infected with hepatitis B virus (HBV) and it is estimated that there are 80 million HBV carriers and the global prevalence of hepatitis C virus infection is around 2% with 170 million persons chronically infected with this virus. In present study total of 10938 donors were screened for 3 years, 2968 (27.1%) were replacement donors and 7970 (72.8%) were voluntary donors as we collect blood through blood donation camps, which is similar to study done by Col R Behl et al and Jain C et al.[8,9] and majority of the donors were males 10484 (95.8%) compared to 454(4.1%) (Table 1) of females which is similar to other studies.[8,9] The seroprevalence in present study was 0.61% (67), of which 92.54% (62) were voluntary group and 7.46% (Table 2).[5] from replacement group, significant difference noticed in the two groups (P0.02) whereas study done by Col R Behl et al 85.67% were replacement donors.[8] probably we collect majority of the blood through blood donation camps. The prevalence of HIV in present study was 0.11% (12), which is lower than the study done by Bharat S et al 0.8% and another study by Pallavi P et al showed 0.44% (Table 3).[10,11] it has been found that prevalence of HBV, HCV and HIV among blood donors or the general population varied from country to country and place to place. The prevalence of HBV in present study is 0.47% (51) which is lower than the studies done by Sangita Patel et al 0.8% and Bharath S et al 1.8% (Table 4).[6,10] and HCV prevalence in present study was 0.04% (4) (Table 5) which is very less compared to study done by Jain A et al 1.57% and Das BK GB et al of 0.35% because of geographical variation in the disease prevalence and over all STDs prevalence decreasing in trend due to better screening methods.[12,13] The decreasing trend in HBV can be due to increasing awareness in public about importance of hepatitis B vaccination in Indian academy of paediatric (IAP) vaccination schedule.[13] When we compare the global prevalence of STDs, we also noticed in present study that there is high prevalence of hepatitis B infection among other STD's suggests further community-based studies to screen for risk factors in the communities for blood born infections. Blood banks in India screen only for HBSag as a marker for HBV which is not sensitive enough to screen during window period so that there is a high chance for recipient to get infected if this blood is transfused. This can be prevented by doing HBV nucleic acid testing (NAT) which we are doing now a day and to develop population specific intervention to interrupt transmission like universal immunisation and personal protection measures. This can be achieved by public awareness and education about need of the hour, blood donation and its benefits through media and NGO's help in conducting public awareness. Transmission of STD's through blood donors occurs during the serologically negative window period which can transmit the infection, therefore special care to be taken in selecting donors blood for HIV, HBV and HCV through standard

tests for ensuring safety of blood recipients. Results of present study indicate that to know the exact assessment of seroprevalance of HBV, HCV and HIV large scale studies over a period has to be done.

CONCLUSION

Most common STDs in blood donors was HBV followed by HIV and HCV. STDs were mainly seen in voluntary donors compared to replacement donors. Majority of the donors were males.

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REFERENCES

1. Fessehaye N, Naik D, Fessehaye T. Transfusion transmitted infections-a retrospective analysis from the National Blood Transfusion service in Eritre. Pan Afr Med J. 2011;9:40-6.
2. Bhawani YRP, Sudhakar V. Seroprevalence of transfusion transmissible infections among blood donors in a tertiary care hospital of Andhra Pradesh. Biol Med. 2010;2(4):45-8.
3. Amiwero CE, Prescott RJ, George OA, Joy NI, Aisha M. Seroprevalence of transfusion transmissible infections among blood donors attending the Federal Medical Centre, Bida. IJMBR. 2013;1:1-7.
4. Saghir SAM, Hassan FMA, Alsalahi OSA, Alhariry AEAA, Baqir HS. Frequencies of HBV, HIV HCV and syphilis markers among blood donors: a hospital based study in Hodeidah, Yemen. Trop J Pharm Res. 2012;11(1):132-6.
5. Singh R, Vohra P, Singla P, Chaudhary U. seroprevalence of transfusion transmissible infections among healthy blood donors at general hospital, Sonepat. North India. J Evol Med Sci. 2013;2(26):4816-20.
6. Patel S, Popat C, Mazumdar V. Seroprevalence of HIV, HBV, HCV and Syphilis in blood donors at a tertiary Hospital I Vadodara. Inter J Med Sci Public Health. 2013;2(3):747-4.
7. Basavaraj B, Rudramma J, Mallikarjuna Swamy CM. Seroprevalence of hepatitis B and hepatitis C viral infections among blood donors of central Karnataka, India. Inter J Med Sci Public Health. 2014;3(1):272-4.
8. Chattoraj A, Behl R. Infectious disease markers in blood donors. Med J Armed Forces India. 2008; 64:33-5.
9. Jain C, Mogra NC, Mehta J. Comparison of seropositivity of HIV, HBV, HCV and syphilis and malaria in replacement and voluntary donors in western India. IJCRR. 2013;5:43-6.
10. Bharath S, Prakash SK, Ravish G. Infectious markers in blood donors of East Delhi: prevalence and trends. Indian J Path Microbiol. 2004;47:477-9.
11. Pallavi P, Ganesh C, Jayashree K. Seroprevalence and trends in transfusion transmitted infections among blood donors in a university hospital blood bank -a 5-year study. Indian J Hematol Blood Transfu. 2011;27:1-6.
12. Jain AI, Rana SS, Chakravarty P, Gupta RK, Murthy NS, Nath MC, et al.The prevalence of hepatitis C virus among the voluntary donors of New Delhi, India. Eur J Epidemiol. 2003;18:695-7.
13. Das BK, Aditya S, Chakravarthy SK, Datta PK. Seroprevalence of hepatitis B, hepatitis C and human immunodeficiency virus among healthy voluntary first-time blood donors in Kolkata. Ann Trop Med Public Health. 2011;4:86-90.
14. Park K Textbook of preventive and social medicine. 20th ed. Banarsidas Bhanot Publishers; 2017:184-194.

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