International Journal of Research in Medical Sciences
Sehgal PK et al. Int J Res Med Sci. 2017 Sep;5(9):3827-3830
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20173647

Original Research Article

Hepatitis B sero-prevalence among blood donors in Haryana: a retrospective record based study

P. K. Sehgal[1]*, Anubha Garg[2]

[1]Department of Transfusion Medicine, Pt. B.D. Sharma PGIMS, Rohtak, Haryana, India
[2]Department of General Medicine, Pt. B.D. Sharma PGIMS Rohtak, Haryana, India

Received: 11 July 2017
Accepted: 27 July 2017

***Correspondence:**
Dr. P. K. Sehgal,
E-mail: bloodbankpgimsrtk7@gmail.com

ABSTRACT

Background: In India, it is mandatory to screen blood donors for HIV, hepatitis B, hepatitis C, syphilis and malaria. Hepatitis B is a major public health problem worldwide. Approximately 30% of the world's population or about 2 billion persons have serological evidence of either current or past infection with hepatitis B virus. The prevalence of chronic HBV infection in India ranges from 2% to 10% as shown by different studies. India therefore comes under the intermediate to high endemicity category. The objective of this study was to carry out with the aim to find out the sero-prevalence of hepatitis B infection and its trend among the blood donors a hospital based blood transfusion service set up in north India over a period of seven years.
Methods: It was record based retrospective study from 2007 to 2013. Before donation "Blood Donation Form" had been filled by every donor and this form had particulars about age, gender, address, and occupation, date of previous donation, any illness and medical treatment taken. The donor blood samples were collected at the time of blood donation from the primary bag and HbsAg screening was done using rapid test kit based on the principle of a one-step immunoassay. Samples showing repeat test reactivity on both methods were considered positive and were included for calculation of seroprevalence.
Results: A prevalence of 01.13% of hepatitis B infection was seen among the donors from the period 2007-2013. The trend of hepatitis B prevalence among donors has been fluctuating while ranging from 0.94% to 1.63%.
Conclusions: Reduction in seroprevalence among voluntary donors requires an effective donor education and high quality selection programme especially during big blood donation camps. For a safe blood service in our country, where comprehensive laboratory tests are neither possible nor pragmatic, it is best to switch over to 100% voluntary donations, as it is now established that only voluntary non-remunerated regular donation is the safest. Thus, one of our key strategies to enhance blood safety is to focus on motivating non-remunerated blood donors and phasing out even replacement donors.

Keywords: Blood safety, Donor, Hepatitis B, Replacement, Voluntary

INTRODUCTION

Blood transfusion service (BTS) is an integral and indispensable part of the healthcare system. The priority objective of BTS is to ensure safety, adequacy, accessibility, and efficiency of blood supply at all levels.[1]

Transfusion of blood and blood components, as a specialized modality of patient management saves millions of lives worldwide each year and reduces morbidity.

It is well known that blood transfusion is associated with a large number of complications, some are only trivial

and others are potentially life threatening, demanding for meticulous pre-transfusion testing and screening. The use of unscreened blood transfusion keeps the patient at risk of acquiring many transfusion transmitted infections (TTI) like hepatitis viruses (HBV, HCV), human immuno-deficiency viruses (HIV), syphilis, malaria, etc. Transfusion departments have always been a major portal to screen, monitor, and control infections transmitted by blood transfusion. Blood transfusion departments do not only screen TTI, but also give clue about the prevalence of these infections in healthy populations.[2]

Hepatitis B virus (HBV) infection is a serious global health problem affecting 2 billion people world-wide and 350 million people suffer from chronic HBV infection.[3] Based on the prevalence of Hepatitis B Surface Antigen (HBsAg), different areas of the world are classified as having high (≥8%), intermediate (2-7%) or low (<2%) HBV endemicity. Countries which have high endemicity (where ≥8% of the population is HBsAg-positive) include South-East Asia, China, most of Africa, most of Pacific Islands, the Amazon basin and parts of the Middle East. Countries with intermediate endemicity (2-7%) include South Asia, Eastern and Southern Europe, Russia and Central and South America. The areas with low endemicity (<2%) include United States, Western Europe and Australia. The prevalence of chronic HBV infection in India ranges from 2 to 10%. India therefore comes under the intermediate to high endemicity category.[4,5]

The present study was conceived with the aim to find out the sero-prevalence of Hepatitis B and C infection among blood donors in a tertiary care institute over the period of seven years.

METHODS

This was a retrospectively cross-sectional study. The study was conducted on all voluntary and replacement donors for a period of seven years from April 2007 to March 2013. The study was conducted in blood bank associated with department of Transfusion Medicine, PGIMS, Rohtak, Haryana. Voluntary blood donation was conducted in the blood bank as well as various blood donation camps. All blood donations collected over this period were included. The donors were either voluntary or replacement donors. Before donation "blood donation form" was filled by every donor and this form had particulars about age, gender, address, and occupation, date of previous donation, any illness and medical treatment taken. The consent was taken from each donor. Blood donation taken only after physical examination carried out by the physician. Professional donors were not taken for donation and ruled out. Blood donations were taken either in outdoor blood donation drives or in blood bank, without remuneration were considered as Voluntary Donors (VD). Replacement Donors (RD) included donation given for a particular patient.

The samples were obtained for serological testing. HbsAg screening was done using rapid test kit based on the principle of a one-step immunoassay (Hepacard, Biomed Industries, India). All reactive samples were tested again using the commercially available Erba Lisa ELISA kit (Transasia Bio-Medicals Ltd, Daman) with reported sensitivity of 100% and specificity of 99.9% per the manufacturer's manual. Samples showing repeat test reactivity on both methods were considered positive and were included for calculation of seroprevalence. For the year 2013, the number of positive hepatitis B subjects was traced to their residences and they were enquired about the probable sources of infection. Their demographic details were also sought. However, their identity was not revealed.

RESULTS

A total of 223202 blood units were collected over a period of 7 years at blood bank and camps. A sero-prevalence of 1.18% of Hepatitis B virus infection was seen among the donors from the period 2007-2013. The trend of hepatitis B prevalence among donors is decreasing while ranging from 0.94% to 1.63%. Figure 1 shows the line diagram for the Hepatitis B infection prevalence. A total of 62 hepatitis B cases were traced and their probable sources of infection were enquired about.

Table 1: Trends in Hepatitis B infection among blood units tested over the study period.

Year	HBsAg positive
2007	429 (1.63%)
2008	348 (1.27%)
2009	329 (1.17%)
2010	420 (1.31%)
2011	379 (1.11%)
2012	392 (1.0%)
2013	357 (0.94%)
Total	2654 (1.13%)

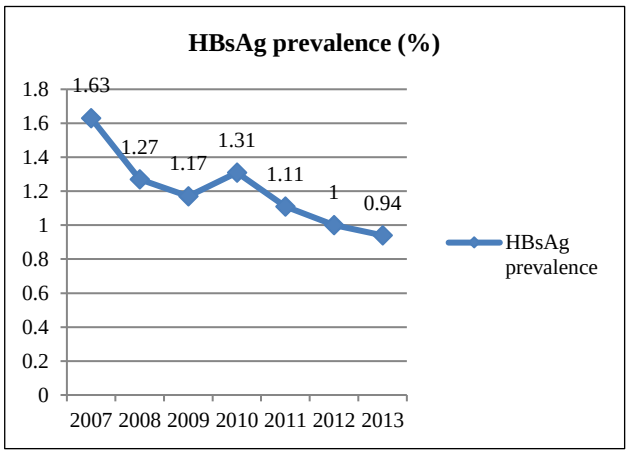

Figure 1: Trends in blood donations over the study period.

Table 2 shows the demographic characteristics of hepatitis B patients detected in year 2013.

Table 2: Demographic details of patients.

Characteristics	Hepatitis B sero-positive cases (n=62)
Age	
<25 years	14
25-45 years	43
>45 years	5
Socioeconomic status	
I	1
II	31
III	13
IV	17
Family members	
Upto 5	34
More than 5	28

43 patients recalled that they had dental treatment, 39 cases had history of therapeutic injection, 11 cases had surgical operation, 19 cases had sexual contact other than regular partner, 28 cases had tattoo on their body and 27 cases had a history of blade/razor trauma with the local barber.

DISCUSSION

Risk of life threatening infections such as HIV, HBV and HCV is highest when a contaminated blood is infused to a person needing blood for life saving condition. Although infections spread by such infusions are less but the efficacy of this route is highest.

A report on blood donation stated that voluntary blood donation is best and should comprise 100% of blood donation. But studies show that in India, about 55% donors are voluntary, rest being replacement donors. Replacement donors are to be associated with a significantly higher prevalence of transfusion-transmissible infections (TTIs) including HIV, hepatitis B, hepatitis C, syphilis and malaria.[6]

The prevalence of hepatitis B infection among our blood donor population was found to be 1.13 per cent using serological tests. The reasons for wide variations in the seroprevalence of hepatitis B may be increased use of different testing kits for hepatitis B and varying sensitivities and specificities, awareness in blood donors for hepatitis B and self-rejection related to it, deferring the donors with high risk behavior, successful post donation counseling of sero-reactive donors and increased voluntary blood donors in comparison of replacement donors. Table 3 shows the comparison of prevalence rates of hepatitis B by various studies conducted at different places.[7-13]

Table 3: Prevalence rates of different studies.

Studies	Study region	Hepatitis B prevalence rate (%)
Gupta et al[7]	Ludhiana	0.66
Pahuja et al[8]	Delhi	2.23
Chandra et al[9]	Lucknow	1.96
Arora et al[10]	Haryana	1.7
Bhattacharya et al[11]	West Bengal	1.46
Srikrishna et al[12]	Bangaluru	1.86
Makroo et al[13]	Delhi	1.18
Present study	Haryana	1.13

Government of India has incorporated vaccination for hepatitis B in national immunization schedule. Hepatitis B vaccine is effective, safe and provides long lasting immunity. This addition is of massive public health importance as hepatitis B virus may lead to acute and chronic hepatitis and also to hepatocellular carcinoma. Adequate blood safety measures as well as perfect donor screening and promotion of voluntary donors is required at the present time.

There is also a growing need to educate and aware health care workers regarding unnecessary injections and unsafe injection practices to prevent the spread of HBV and other blood borne infections. No re-use of syringes and usage of single use disposable syringes or fluid infusion sets should be made. Mass awareness of public regarding various procedures like tattoo making, skin piercing and dental treatment should be done so that only disinfected materials be used for these purposes.

The first step in tackling hepatitis B is to have more accurate estimate of burden of the disease. There is need to map out areas with high endemicity levels and these areas should be made focus of intensive screening and protective measures.

CONCLUSION

This study reports a lower prevalence of hepatitis B infection as compared to other studies. Although it does not represent sero-prevalence among general population as mostly males are the blood donors. Awareness regarding blood donation should be made. Along with advanced technology for donor screening and other factors such as educational and motivational programs and mass immunization programs may help in decreasing the infection. Health care workers at risk of infection should be vaccinated before providing patient care. Pre-donation counseling, donor self-exclusion and ensuring 100% voluntary blood donation will be effective in decreasing the hepatitis B infection rate.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Islam MB. Blood transfusion services in Bangladesh. Asian J Transf Sci. 2009;3:108-10.
2. Khan ZT, Asim S, Tariz Z, Ehsan IA, Malik RA, Ashfaq. Prevalence of transfusion transmitted infections in healthy blood donors in Rawalpindi District, Pakistan: a five-year study. Int J Pathol. 2007;5:21-5.
3. Dhawan HK, Marwaha N, Sharma RR, Chawla Y, Thakral B, Saluja K, et al. Anti-HBc screening in Indian blood donors: Still an unresolved issue. World J Gastroenterol. 2008;14(34):5327-30.
4. Singh K, Bhat S, Shastry S. Infection among blood donors of coastal Karnataka. J Infect Dev Ctries. 2009;3(5):376-9.
5. Prevention of hepatitis B in India, An overview. World Health Organization, New Delhi; 2002.
6. National AIDS Control Organization (NACO). Voluntary Blood donation programme- An operational guideline. Ministry of Health and Family Welfare, New Delhi; 2007:13
7. Gupta N, Kumar V, Kaur A. Seroprevalence of HIV, HBV, HCV and syphilis in voluntary blood donors. Indian J Med Sci. 2004;58:255-7.
8. Pahuja S, Sharma M, Baitha B, Jain M. Prevalence and trends of markers of hepatitis C virus, hepatitis B virus and human immunodeficiency virus in Delhi blood donors. A hospital based study. Jpn J Inf Dis. 2007;60:389-91.
9. Chandra T, Kumar A, Gupta A. Prevalence of transfusion transmitted infections in blood donors: an Indian experience. Trop Doct. 2009;39:152-4.
10. Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. Indian J Pathol Microbiol. 2010;53:308-9.
11. Bhattacharya P, Chakraborty S, Basu SK. Significant increase in HBV, HCV, HIV and syphilis infections among blood donors in West Bengal, Eastern India 2004-2005. Exploratory screening reveals high frequency of occult HBV infection. World J Gastroenterol. 2007;13:3730-3.
12. Srikrishna A, Sitalakshmi S, Damodar P. How safe are our 21. Comparison of seropositivity of HIV, HBV, HCV and syphilis in replacement and voluntary. 1999;44:409-12.
13. Makroo RN, Hegde V, Chowdhry M, Bhatia A, Rosamma NL. Seoprevalence of infectious markers and their trends in blood donors in a hospital based blood bank in north India. Ind J Med Res. 2015;142(3):317-22.

Cite this article as: Sehgal PK, Garg A. Hepatitis B sero-prevalence among blood donors in Haryana: a retrospective record based study. Int J Res Med Sci 2017;5:3827-30.