



SERO-PREVALENCE OF HEPATITIS B VIRUS INFECTIONS AMONG VOLUNTARY BLOOD DONORS IN A TERTIARY CARE HOSPITAL, PUDUCHERRY

Dr.A.Manoharan*

Assistant Professor, Department of Pathology and Blood bank Incharge, Sri Lakshmi Narayana Institute Of Medical Sciences, Puducherry.

*Corresponding Author

Dr.Pammy Sinha

Professor and Head, Department of Pathology, Sri Lakshmi Narayana Institute Of Medical Sciences, Puducherry.

ABSTRACT

Background: The process of voluntary blood donation is encouraged in order to meet the demand of blood and its components for the needy patients. The screening of blood for various infections in blood bank is a routine procedure. Yet the prevalence of transfusion associated hepatitis B and hepatitis C virus infection varies in common populations. So, identifying the sero-prevalence of this infection helps in taking preventive measures. Here, we screen to estimate the sero-prevalence of hepatitis B infections among the voluntary blood donors in our hospital.

Aims and Objectives: To estimate the seroprevalence of Hepatitis B virus infection among voluntary blood donors at blood bank in Sri Lakshmi Narayana Institute of medical sciences, Puducherry.

Methods: The voluntary donors blood samples were collected in Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry for the period of four years from (August 2014 to July 2018). The total sample collected and screened were 1100. All the voluntary blood donors (1100) serum were screened for HBsAg using hepacard card test. The card has antisera anti-HBsAg dispersed on membrane.

Results: Out of 1100 donors, only 9 voluntary blood donors showed positive for hepatitis B infection. Out of 9 hepatitis positive donors, 3 are females and 6 were males with male to female ratio 6:3.

Conclusions: The findings suggest that the hepatitis infections are of low endemic in this area. The males are more likely to be positive than females. So, Planning more extensive screening and conducting many vaccination and educational programs would help reduce the transmission of the infection among the general population.

KEYWORDS : Hepatitis B, Sero-prevalence

INTRODUCTION

Nowadays transfusion of blood and its components plays a major role in life saving for the needy patients. It can be used in prophylactic and therapeutic management of several critical health problems. The demand of blood and its products are more when compared to the availability of resources in any blood bank. Hence, voluntary blood donors are promoted to make the sufficient availability of blood in a blood bank¹⁻⁴. The screening of such blood for various transfusion associated infections becomes mandatory. Such screening provides the maximum protection against various transfusion transmitted infections like HIV, HbSAg, HCV, malaria, etc.

The most common and dangerous infection transmitted by blood transfusion is Hepatitis B virus. HBV mainly affects the liver of which 400 million people are chronic carriers of which 75% live in Asia. The major route of spread is by blood and mainly through perinatal transmission, close bodily contact in cut injuries and blood transfusion. The incidence of transfusion-related spread has been greatly reduced due to screening of donated blood and HBsAg.^{3,8}

India has the moderate to high endemicity in HBV infection with the prevalence of 2% to 10%. Some blood donors are in window period showing negativity of HBsAg, which transmits virus and causes serious health problems. The average incubation period of the virus is 90 days from the time of exposure to onset of symptoms but may vary from 6 weeks to 6 months.^{5,7,8,10}

The screening of blood for various infections in blood bank is a routine procedure. Yet the prevalence of transfusion associated hepatitis B virus infection varies in common populations.^{11,12} So, identifying the sero-prevalence of this infection helps in taking preventive measures. Here, we screen to estimate the sero-prevalence of hepatitis B infections among the voluntary blood donors in our hospital.

Aims and Objectives:

1. To identify the seroprevalence of Hepatitis B virus infection among voluntary blood donors in a blood bank at Sri Lakshmi Narayana Institute of medical sciences, Puducherry.
2. To identify the sex ratio among voluntary blood donors with HBsAg positive.

MATERIALS AND METHODS:

The voluntary donors blood samples were collected in Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry for the period of four years from (August 2014 to July 2018). The total sample collected and screened were 1100. All the voluntary blood donors (1100) serum were screened for HBsAg using hepacard card test. The card has antisera anti-HBsAg dispersed on membrane.

Principle:

HEPACARD is a one step immunoassay based on the antigen capture or "sandwich" principle. The method uses monoclonal antibodies conjugated to colloidal gold and polyclonal antibodies immobilized on a nitrocellulose strip in a thin line. The test sample is introduced to and flows laterally through an absorbent pad where it mixes with the signal reagent. If the sample contains HBsAg, the colloidal gold antibody conjugate binds to the antigen, forming an antigen-antibody-colloidal gold complex. The complex then migrates through the nitrocellulose strip by capillary action. When the complex meets the line of immobilized antibody (Test line) "T", the complex then migrates through the nitrocellulose strip by capillary action. When the complex meets the line of immobilized antibody (Test line) "T", the complex is trapped forming an antibody-antigen-colloidal gold complex. This forms a pink band indicating the sample is reactive for HBsAg. To serve as a procedural control an additional line on the strip. If the strip is performed correctly, this will result in the formation of a pink band upon contact with the conjugate.

RESULTS:

Out of 1100 donors, only 9(0.8%) voluntary blood donors showed positive for hepatitis B infection. Out of 9 hepatitis B positive donors, 33% are females and 66% were males with male to female ratio 6:3.

Table 1: Prevalence of HBsAg among voluntary blood donors

Total voluntary blood donors screened for HBsAg	HBsAg positive among voluntary blood donors	HBsAg negative among voluntary blood donors
1100	9	1091
	0.8%	99.2%

Table 2: Sex distribution

HBsAg positive among voluntary blood donors	Male	Female
9	6	3
	66%	33%

Table 3:

Total voluntary blood donors	Male	Female
1100	6(0.54%)	3(0.27%)

DISCUSSION:

The transfusion of blood and its products plays an important role in the management of several critical health problems both prophylactically and therapeutically. The screening of blood among the donors provides wide range of protection against various diseases like HIV, HbSAg, HCV, etc.. These transfusion transmitted infections can be avoided by routine screening of all donated blood^{2,6}.

Providing the safest blood is utmost importance to every blood bank. The need of this study indicates the sero-prevalence of HBsAg among the voluntary blood donors^{5,8}.

Hepatitis B virus has HBV surface antigen and it was identified around 1960 when Australian antigen was identified causing acute and chronic hepatitis. These infections are usually self limited whereas in approximately 0.1 to 0.5% causes fulminant hepatitis^{4,9}.

According to WHO the HBsAg prevalence among blood donors, tamilnadu stands in low prevalence area (<2%). Our study also have low prevalence rate^{5,6}.

In our study the sero prevalence of HBsAg among voluntary blood donors is high in males(0.54%) when compared to females (0.27%) which is in similar with other studies by Gupta et al, Shah et al, Patel et al, Meena et al.^{1,11,12,13}

Comparison with various studies:

Various studies	HBsAg positivity (%)
Gupta et al	0.6
Shah et al	0.9
Patel et al	0.9
Meena et al	1.2
Present study	0.8

These comparative studies shows the seroprevalence of hepatitis B infection among voluntary blood donors are in same range.

CONCLUSIONS:

The findings suggest that the hepatitis B infections are of low prevalence in this area. The males are more likely to be positive than females. Though low endemic still proper counseling and self exclusion of voluntary donors are to be encouraged for safe blood transfusion.^{4,14-16} So, Planning more systematic and extensive screening, vaccination, regular follow-up will drastically reduce the transmission of the infection among the general population.

REFERENCES:

- Gupta N, Kumar V, Kaur A. Seroprevalence of HIV, HBV, HCV and syphilis in voluntary blood donors. Indian J Med Sci 2004;58:255-57.
- Nkrumah B, Owsu M, Frempong H, Avenu P. Hepatitis B and C viral infections among blood donors from rural Ghana. Ghana Med J. 2011;45(3):97-100.
- Chandra T, Kumar A, Gupta A (2009) Prevalence of transfusion transmitted infections in blood donors: an Indian experience. Trop Doct 39:152-154 Indian J Hematol Blood Transfus (Jan-Mar 2011) 27(1):1-6.
- Bagiyalakshmi V, Gopal R, Elangovan RS. Prevalence of Hepatitis B Virus Infection among Voluntary Blood donors at a Tertiary Care Hospital Blood Bank - Tiruchirappalli. Int J Sci Stud 2017;4(10):105-108.
- Giri PA, Deshpande JD, Phalke DB, Karle LB. Seroprevalence of transfusion transmissible infections among voluntary blood donors at a tertiary care teaching hospital in rural area of India. J Family Med Prim Care 2012; 1: 48-51.
- World Health Organization. Blood transfusion safety, Geneva; 2006.
- Taylor JM, Purcell RH, Farci P. Hepatitis D (Delta) virus. In: Knipe DM, Howley PM, editors. Fields virology. 6. Philadelphia: Lippincott Williams & Wilkins; 2013.
- 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 Infect Dis 2007; 60: 389-91.
- Tong S, Li J, Wands JR, Wen Y. Hepatitis B virus genetic variants: biological properties and clinical implications. Emerg Microb Infect. 2013;2
- Sehgal S, Shaiji PS, Brar PK. Seroprevalence and Trends of Transfusion Transmissible Infections in Blood Donors in Andaman and Nicobar Islands- An Institutional Retrospective Study. J Clin Diagnostic Res 2017;11(4):21-4.
- Shah N, Shah JM, Jhaveri P, Patel K, Shah CK, Shah NR. Sero-prevalence of HBV, HCV, HIV and syphilis among blood donors at a tertiary Care Teaching Hospital in Western India. GMJ 2013;68:35-9.
- Meena M, Jindal T, Hazarika A. Prevalence of hepatitis B virus and hepatitis C virus among blood donors at a tertiary care hospital in India: a five-year study. Transfusion 2011;51(1):198-202.
- Patel B., Kotadiya T. Seroprevalence of Hepatitis B virus among blood donors at a tertiary care hospital in Gujarat. J Diagn Pathol Oncol 2018;3(4):335-39.
- Saha V, John TJ, Dhamodaran S, Carman RH. Highly sensitive screening tests for hepatitis B surface antigen in transfusion centres of developing countries. Br Med J. 1988;297(6644):334.
- Ndumbe PM, Nyouma E. Transmission of hepatitis B virus by blood transfusion in Yaounde, Cameroon. BMJ. 1990;301(6751):523-524.
- Jadeja P, Kaur A, Shekha H. Trend in seroprevalence of hepatitis b virus infection among blood donors at a tertiary care centre of Rajasthan, India. Natl J Med Res 2014;4:205-7.