www.jmscr.igmpublication.org *Impact Factor 1.1147*
ISSN (e)-2347-176x

IGM Publication Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Seroprevalence of Hepatitis B in Male Blood Donors in Rural Teaching Hospital of Northern Maharashtra, India

Authors

Indu Bhushan[1], Vijay C. Ambade[2], Rashmi Sinha[3]

[1]Department of Pathology, [2]Department of Microbiology, [3]Department of Biochemistry, ACPM medical college, Dhule-424001, Maharashtra, India
Corresponding Author
Vijay C. Ambade
Department of Microbiology, A.C.P.M. Medical College, Dhule- 424001, Maharashtra, India
Email-*drvijayambade@gmail.com*

ABSTRACT

Aim*: This study was aimed to know the seroprevalence of hepatitis B infection in male blood donors.*

Material & Methods: *The present retrospective hospital record-based study was conducted at the blood bank of a rural tertiary care teaching hospital in northern Maharashtra, India over a period of 4 &1/2 years from January 2010 to June 2014. All the blood units collected were screened for HBV, HCV, HIV 1 and 2, syphilis and malaria. The data of HBsAg alone was analyzed with chi square test and results were considered significant if P value was < 0.05.*

Results: *The overall seroprevalence rate was 1.63% among the total 3920 blood donors included in this study. The correlations of seroprevalence rate among selected age groups and in voluntary and replacement blood donors were found to be statistically insignificant. Conclusion: The lower seroprevalence rate in this study, further recommends strict abiding to donor selection criteria, comprehensive screening of blood donors, better awareness among donors and reintensification of prophylactic programmes at public level to ensure the safe blood donation.*

Keywords: *Blood donation, Hepatitis B, Hepalisa, Seroprevalence*

INTRODUCTION

Hepatitis B virus (HBV) infection is a global health problem and it is estimated by the World Health Organization (WHO), approximately one-third of the world population has been infected with HBV with serological evidence of past or present infection[1]. HBV infection is the leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC)[2]. As per WHO guidelines, Countries are classified on the basis of endemicity of HBV infection into high (≥8%), intermediate (2 to 7%) or low (≤2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2 to 10%. India therefore comes under the intermediate to high endemicity category[3]. A high endemicity of HBV infection has been reported in the tribal populations of India which has been attributed to inbreeding, poor hygienic living conditions, close person-to-person contact and certain socioculture practices which may facilitate transmission of HBV[4].

This infection is transmitted mainly through blood and blood products, vertically from mother to neonates and body secretions[2]. Blood transfusion associated hepatitis B viral infection continues to be a major problem in India even after adoption of mandatory screening of hepatitis B surface antigen (HBsAg) by enzyme-linked immuno-sorbent assay (ELISA)[5]. The study of seroprevalence rate of hepatitis B in blood donors is a crucial index for assessing the magnitude of HBV infection and the disease trend in the general population. Further more such study gives us guidance as to what further is to be done in our public education and improving prophylactic measures including vaccination and nucleic acid testing (NAT). A teaching Hospital patient based study is helpful in assessing true nature of problem in the community. To the best of our knowledge, there is no such study has been carried out recently on seroprevalence of hepatitits B infection in northern Maharashtra. Keeping these facts in mind, the present study is aimed to know the seroprevalence of hepatitis B infection among male blood donors in this area.

MATERIAL AND METHODS

The present retrospective hospital record-based study conducted at the blood bank of a rural tertiary care teaching hospital in northern Maharashtra, India. Data was collected over a period of 4 &1/2 years from January 2010 to June 2014. In this period, 3920 voluntary and replacement male blood donors (blood donated to replace blood utilized, and often includes friends or relatives of patients) were included in the study. Donors were selected by the standard criteria for donor fitness. Persons belonging to high risk groups such as patients from thalassemia clinics, sexually transmitted diseases clinics, professional blood donors, drug abusers, dialysis patients, sex workers, pregnant women, etc. were excluded from the study. All the blood units collected were screened for HBV (HBsAg), hepatitis C virus (HCV), human immunodeficiency virus (HIV) 1 and 2, syphilis (VDRL) and malaria. The screening for HBsAg in all the serum samples

collected were performed using commercial kits based on the microwell ELISA (Hepalisa, J.Mitra and Co. Pvt. Ltd. India) as per the manufacturer's instructions. The data of HBsAg alone was analyzed with chi square test and results were considered significant if P value was < 0.05.

RESULTS:

Among the total 3920 blood donors included in this study, voluntary blood donors were 77.72% and 22.27% were replacement donors . The overall seroprevalence rate in the present study was 1.63% with higher in voluntary donors (1.77%) in comparison to replacement donors (1.14%) as shown in table 1. Age wise seroprevalence was found to be more in 18 to 26 years group with 1.66% (Table 2).

Table 1: HBsAg positivity with respect to type of blood donor

Blood donor	Total No.	HBV (+)	Percentage (%)
VD	3047(77.72%)	54	1.77
RD	873(22.27%)	10	1.14
TOTAL NO.	3920	64	1.63

VD – Voluntary blood donor, b) RD – Replacement blood donor

Table 2 : Age group wise HBsAg positivity in blood donors

Age group	Total No.	HBV (+)	Percentage (%)
18-26	839	14	1.66
27-35	1662	27	1.62
36-44	800	13	1.62
45-53	486	08	1.64
54-60	133	02	1.50
TOTAL	3920	64	1.63

DISCUSSION

In India the HBsAg prevalence among different populations and geographical areas varies greatly and very high prevalence has been noted among the aborigine population of Andaman and in Arunachal Pradesh[6]. The overall seroprevalence rate 1.63% found among total 3920 male blood donors included in our study was in concurrence with the previous report by Bhattacharya P et al[7] (1.66%), Iram Manzoor et al[8] (1.70%) and 1.7% in the study of Dimple Arora et al[9]. Our finding was also comparable with seroprevalence of 1.5%, 1.8 % and 1.09% in the study of Archana S. Bembde et al[10],Singh et al[11] and Purushottam A.

Giri et al[12] respectively. Some of the studies from Maharashtra region, as conducted by SS Patil et al [13], Mudholkar Vishal G et al[14] and Sonwane BR et al[15] were reported higher seroprevalence rate of 2.99%, 2.90%, 2.78% respectively in comparison to our study. Lack of awareness and carrier state seems to be the reason for this higher seroprevalence. The seroprevalence rate reported in the studies of Chattoraj A et al[16] (0.99 %) and Karandeep Singh et al[3] (0.62 %) were lower than the present study due to high literacy rate, awareness about the disease and modes of prevention, implementation of strict pre-donation counseling and donor selection criteria help in excluding the possibly infected donors. The higher seroprevalence rate in age group 18-26 years observed in this study was not statistically significant but comparable with Tessema B et al[17], Baba et al[18] Zulficar et al[19] and Sayed A. Quadri et al[20]. Higher seroprevalence in youth in our study, needs further reintensification of preventive programmes aimed at high risk behavioural change, as this is the most productive and economically viable group of population. The higher seropositivity in voluntary donors than replacement donors in the present study was not statistically significant. This high seropositivity in voluntary donors than replacement donors can be comparable to the study conducted by Chattoraj et al[21] and *S* Gulia et al[22] but shows variance from other studies[23,24,25] which showed a higher seropositivity in replacement than voluntary donors. The reason could be probable inclusion of professional blood donors.

CONCLUSION

The lower seroprevalence rate in this study, further recommends comprehensive screening of blood donors with recommended method, strict donor selection criteria, better education of donors and improved prophylactic measures at public level to ensure the safe blood donation.

REFERENCES

1. World Health Organization (2012). Hepatitis B. World Health Organization Fact Sheet 204 (Revised August 2008). [online] Available from http://who.int/inf-fs/en/fact204.html. [Accessed Sep 2012].
2. Surendra K, Prakash G, Bishnu RT, Manita R (2008). HBsAg Serosurveillance among Nepalese blood donors. Ann. Trop. Med. Public Health 1(1):15-18.
3. Karandeep Singh, Sudha Bhat, Shamee Shastry. Trend in seroprevalence of Hepatitis B virus infection among blood donors of coastal Karnataka, India *J Infect Dev Ctries* 2009; 3(5):376-379.
4. Murhekar MV, Murhekar KM, Sehgal SC. Epidemiology of hepatitis B virus infection among the tribes of Andaman and Nicobar Islands, India, Trans R Soc Trop Med Hyg. 2008;102:729-34.
5. V. Lavanya, T. Viswanathan, S. Arul Sheeba Malar, A. Malarvizhi and K. Moorthy. Prevalence of hepatitis B virus infection among blood donors with antibodies to hepatitis B core antigen. Int. J. Med. Med. Sci.2012; 4(6):128 – 137.

6. Chaudhary A. Epidemiology of Hepatitis B virus in India. *Hep B Annual,* 2004; 1:17-24 .
7. Bhattacharya P, Chandra PK, Datta S, Banerjee A, Chakraborty S, Rajendran K, Basu SK, Bhattacharya SK, Chakravarty R. 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 21: 3730-3733.
8. Iram Manzoor, N Hashmi, S Daud, S Ajmal, H Fatima, Z Rasheed and S Syed. Seroprevalence of transfusion transmissible infections (TTIs) in blood donors. Biomedia, 2009; 25:154-158.
9. Dimple Arora, Bharati Arora, Anshul Khetarpal. Seroprevalence of HIV, HBV,HCV & Syphilis in Blood Donors in Southern Haryana. *Indian Journal of Pathology & Microbiology* 2010:308-309
10. Archana S. Bembde, Neha A. Mahajan, Chandrashekhar P. Bhale, Smita S. Mulay. Prevalence of Transfusion Transmitted Viral Diseases among Blood Donors in MGM Medical College, Aurangabad, Maharashtra. International Journal of Health Sciences & Research 2013;3(1)
11. Singh B, Verma M and Verma K. Markers for transfusion associated hepatitis in North Indian blood donors :prevalence and trends. Jpn J. Infect. Dis.2004;57, 49-51.
12. Purushottam A. Giri, Jayant D. Deshpande, Deepak B. Phalke, and Laximan B. Karle. 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 Jan-Jun; 1(1): 48–51.
13. SS Patil, SA Nikam, SB Dama, RP Chondekar, RV Kirdak, LB Dama. Prevalence of hepatitis-B surface antigen (HBsAg) positivity in Solapur District, Maharashtra State, India. Bangladesh Journal of Medical Science. 2011; 10(2)
14. Mudholkar Vishal G .Trends in Seroprevalence of HIV, Hepatitis B, Hepatitis C and Syphilis infections among blood donors at Tertiary hospital. International Journal of Medical and Applied Sciences 2014;3(2).
15. Sonwane BR, Birare SD, Kulkarni PV. Prevalence of serpreactivity among blood donors in rural population. Indian J Pathol Microbial. 2003; 57:405-407.
16. Chattoraj A, Behl R,Kataria VK. Infectious Disease markers in Blood Donors. Medical Journal Armed Forces India. 2008; 64:33-35
17. Tessema, B. Yismaw,G. kassu, A. Sack, U. Seroprevalence of sexually transmitted infections among antenatal clinic attendees in Gonder health centre, northwest Ethiopia,Tirunech M. Ethiop Med J.2008;46(4):359-66.

18. Baba MM, Hassan AW, Gashau W. Prevance of hepatitis B antigenaemia and human immunodeficiency virus in blood donors in Maidugiri, Nigeria. Niger J Med 2000;9:10-12
19. Zulfikar Ahmed ,Umaru N, Sreesha K. Seroprevalence of transfusion transmitted infections among blood donors in Manglore. Medica Innovatica 2012;1(2)
20. Sayed A. Quadri1, H.J. Dadapeer, K. Mohammed Arifulla and Nazia Khan. Prevalence of Hepatitis B Surface Antigen in hospital based population in Bijapur, Karnataka. Al Ameen J Med Sc i 2013; 6(2) :180-182
21. Chattoraj A, Behl R, Kataria VK.(2008) Infectious Disease Markers in Blood Donors Medical journal Armed Forces of India. 64: 33-35.
22. *S Gulia, S Panda, E Sitaramam, K Reddy.* Seroprevalence Of Hepatitis B Virus Infection Among Blood Donors In Local Population. The Internet Journal of Pathology. 2010;12(1).
23. Allain JP , Candotti d et al . The risk of Hepatitis b virus infection by transfusion in Kumsai , Ghana . Blood ;2003;101(6):2419 – 2425
24. Mayer LA , Most EE . Hepatitis B virology Epidemiology Disease and Prevention and an overview of viral Hepatitis , Immunization in Medical Education . American Family Physician ; 1995;10(5):45 – 55
25. Maddrey WC. Hepatitis B: an important public health issue. J Med Virol; 2000;61:362-66