

PREVALENCE OF MARKERS OF HEPATITIS-B IN VOLUNTARY BLOOD DONORS IN FATEHABAD DISTRICT OF HARYANA

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ABSTRACT

Hepatitis B is one of the transfusion transmissible infections. The prevalence of this infection varies across the different geographies. Noting the trend in seroprevalence of hepatitis-B infection is useful to assist the preventive strategies. This study was aimed to know the seroprevalence of hepatitis B infection in voluntary blood donors in Fatehabad District of Haryana. The present retrospective hospital record-based study was conducted at the blood bank of Fatehabad district in Haryana in India over a period 2 years from August 2012 to June 2014. All the blood units collected were screened for HBV, HCV, HIV 1 and 2, syphilis and malaria. ELISA was used to detect the hepatitis B surface antigen in the donors as a marker of infection. The data of HBsAg alone was analyzed with chi square test and results were considered significant if P value was < 0.05 . A total of 5397 blood donors were studied. 99 (1.83%) were seropositive for hepatitis-B, which comes under the “low prevalence ($< 2\%$) zone” per World Health Organization (WHO) guidelines. A higher seroprevalence rate was observed among male donors than in female blood donors (1.69% versus 0.15% respectively). Age wise seroprevalence was found to be more in 21 to 30 years group with 0.82%. The majority of the seropositive donors were younger than 40 years (86 donors were 40 years of age or less, and 12 donors above 40 years). 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, Seroprevalence*

INTRODUCTION

Hepatitis B virus (HBV) infection is a global health problem. 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 (WHO, 2012).

As per WHO guidelines, countries are classified on the basis of endemicity of hepatitis B virus (HBV) infection into high (8% or more), intermediate (2-7%) or low (less than 2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2% to 10% as shown by different studies (WHO, 2002). India therefore comes under the intermediate to high endemicity category.

HBV infection is the leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC). This infection is transmitted mainly through blood and blood products; vertically from mother to neonates and body secretions (Surendra *et al.*, 2008).

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 immunosorbent assay (ELISA) (Lavanya *et al.*, 2012).

The study of seroprevalence rate of hepatitis B in blood donors helps in determining the safety of the blood products and for assessing the magnitude of HBV infection.

The study also aimed to determine the trend in hepatitis B infection and to compare the prevalence with that of other areas in India.

Further more such study should help in the creation of long-term strategies for improving public health by preventing spread of the disease in the local population and improving prophylactic measures including vaccination.

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MATERIALS AND METHODS

The present retrospective hospital record-based study was conducted at the blood bank of Fatehabad district in Haryana in India. Data was collected over a period 2 years from from August 2012 to June 2014. In this period, 5397 voluntary blood donors were included in the study. Donors were selected by the standard criteria for donor fitness. They were carefully selected for donation by trained personnel after a complete physical examination and satisfactorily answering the donor’s questionnaire. Persons belonging to high risk groups such as patients from thalassemia clinics, sexually transmitted diseases clinics, professional blood donors, drug abusers, dialysis patients, 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 AND DISCUSSION

Out of the total 5397 blood donors, 5119 (94.84%) were males and 279 (5.16%) were females with male to female ratio of 18.34:1 (Table I). The overall seroprevalence rate in the present study was 1.83% as shown in Table II. A higher seroprevalence rate was observed among male donors than in female blood donors (1.69% versus 0.15% respectively) (Table II).

Age wise seroprevalence was found to be more in 21 to 30 years group with 0.82%. The majority of the seropositive donors were younger than 40 years (86 donors were 40 years of age or less, and 12 donors above 40 years) (Table III).

Table I: Donor category and gender distribution (age: 18-60years)

Year	Total donors	Male donors		Female donors	
		No.	Percentage	No.	Percentage
2012	661	629	95.15%	32	4.84%
2013	3152	3035	96.28%	117	3.72%
2014	1584	1455	91.86%	129	8.14%
Total	5397	5119	94.84%	279	5.16%

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

HBsAg positive blood donors

Year	Total donors	Male donors		Female donors		Total HBsAg positive donors	
		No.	%	No.	%	No.	%
2012	661	12	1.82%	1	0.51%	13	1.96%
2013	3152	36	1.14%	6	0.19%	42	1.33%
2014	1584	43	2.71%	1	0.15%	44	2.77%
Total	5397	91	1.69%	8	0.15%	99	1.83%

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Table III: Age group wise HBsAg positivity in blood donors

Age group	2012		2013		2014		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Total
18-20 years	3(0.45%)	0(0%)	5(0.16%)	1(0.05%)	8(0.51%)	0(0%)	16(0.29%)	1(0.02%)	17(0.34%)
21-30 years	4(0.61%)	1(0.15%)	15(0.48%)	3(0.1%)	21(1.33%)	0(0%)	40(0.74%)	4(0.07%)	44(0.82%)
31-40 years	4(0.61%)	0(0%)	10(0.32%)	2(0.06%)	9(0.56%)	1(0.06%)	23(0.43%)	3(0.06%)	26(0.48%)
41-50 years	1(0.15%)	0(0%)	6(0.19%)	0(0%)	3(0.19%)	0(0%)	10(0.19%)	0(0%)	10(0.19%)
> 50 years	0(0%)	0(0%)	0(0%)	0(0%)	2(0.13%)	0(0%)	2(0.13%)	0(0%)	2(0.13%)
Total	12(1.82%)	1(1.15%)	36(1.15%)	6(0.19%)	43(2.77%)	1(0.06%)	91(1.69%)	8(0.15%)	99(1.83%)

Discussion

According to India's Drugs and and Cosmetics Act (1989), each blood unit has to be tested for hepatitis B virus infection (Drugs and Cosmetics Act, 1989). In our study, among the 5397 blood donors screened, the overall seroprevalence of HBsAg observed as 1.83% was in concurrence with the results observed in the previous studies done by Bhattacharya *et al.*, (1.66%), Iram *et al.*, (1.70%) and Arora *et al.*, (1.7%) (Bhattacharya *et al.*, 2006; Manzoor *et al.*, 2009; Arora *et al.*, 2010). According to the WHO classification, this area of Haryana qualifies as a low prevalence area (less than 2%). Some of the studies from Maharashtra region, as conducted by Patil *et al.*, (2010) Mudholkar *et al.*, (2014) and Sonwane *et al.*, (2003) reported higher seroprevalence rate of 2.99%, 2.90%, 2.78% respectively in comparison to our study (Patil *et al.*, 2010; Mudholkar *et al.*, 2014; Sonwane *et al.*, 2003). Lack of awareness and carrier state seems to be the reason for this higher seroprevalence.

The seroprevalence rate reported in the studies of Chatteraj *et al.*, (0.99 %) and Singh *et al.*, (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 (Chatteraj *et al.*, 2008; Singh *et al.*, 2009). Seroprevalence of HBsAg was significantly high in male donors as compared to female donors in our study. It is to be noted that the majority of our study population were males. A significantly higher HBsAg seroprevalence in males than in females is also reported by Chandrasekaran *et al.*, (2000) in Madurai (Chandrasekaran *et al.*, 2000). Rodenas *et al.*, (2006) reported the higher prevalence of HBsAg in donors older than 38 years, whereas in the present study, the majority of seropositive donors were younger than 40 years (Rodenas *et al.*, 2006). The higher seroprevalence rate in age group 21-30 years observed in this study was comparable with Tessema *et al.*, (2008), Baba *et al.*, (2000) and Quadri *et al.*, (2013). Higher seroprevalence in youth in our study needs further reintensification of preventive programmers aimed at high risk behavioral change, as this is the most productive and economically viable group of population. Ensuring the safety of patients by reducing the residual risk of transfusion transmitted hepatitis is the concern of every transfusion center. Public awareness, educational and motivational programs, mass immunization programs, ensuring 100% voluntary blood donation, implementation of strict pre-donation counseling and donor selection criteria will be effective in decreasing the hepatitis B infection rate.

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.

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