



Seroprevalence of Hepatitis B And Hepatitis C Virus Infection Among Healthy Blood Donors In A Tertiary Care Hospital: A Retrospective Study.

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ABSTRACT

Background: Infection by HBV and HCV cause serious mortality, morbidity and financial burden leading to a major global health problem.

Aim: This study was conducted to investigate the prevalence of HBV and HCV infection among healthy blood donors of Jorhat Medical College and Hospital from March 2013-Feb 2016 and compare its prevalence among blood donors from other parts of India.

Method: A total of 27,606 healthy blood donors was selected and found in the age group 18-47 years in the blood bank of JMCH. All the blood bags from these donors were screened for transfusion transmitted infections like hepatitis B, hepatitis C, HIV, VDRL and malaria parasite.

Result: The most common infection was hepatitis B (0.57%) followed by Hepatitis C (0.42%). Replacement donors showed more seropositivity (56.4%) than voluntary donors (43.5%).

Conclusion: The occurrence of HBV and HCV infection among blood donors should be monitored carefully to ensure safer blood transfusion.

KEYWORDS : Seroprevalence, hepatitis B, hepatitis C, Blood Donors.

INTRODUCTION

There are striking epidemiological and clinical parallels between Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infection. Each virus can be transmitted by blood-borne route such as transfusion or injected drug abuse. About two billion people in the world including an estimated 400 million chronically infected Hep B cases are reported. (1) An estimated 3.9 million persons are infected with Hepatitis C virus and have a high rate of development of cirrhosis. Infection by HBV and HCV cause serious mortality, morbidity and financial burden and are thus a major global health problem (2). HCV recognized as the primary cause of transfusion associated nonA nonB viral hepatitis worldwide (3). Recent studies conducted among blood donors in Ethiopia has shown decreasing trends of HBV & HCV (4). The high incidence is reported in multiple transfusions. It is based on the high prevalence and the various sequelae of these infections, especially liver cirrhosis and primary liver cell carcinoma; we evaluated the seroprevalence of hepatitis B & C virus among blood donors.

MATERIALS & METHODS

This retrospective study was carried out in the blood bank, Jorhat Medical & Hospital, Jorhat, Assam, North-east India, over a period of three years from March 2013 – Feb 2016, including both voluntary and replacement donors (replacement donors are either relative or friends of patients). All the blood bags collected during the study period were screened for TTIS like HBsAg (Hepalisa, J Mitra & Co. Pvt. Ltd., New Delhi, India), anti hepatitis C virus antibodies (HCV Ab, Microcrisis, J Mitra & Co. Pvt. Ltd., New Delhi, India), anti HIV Ab (HIV 3rd generation kit for HIV 1&2, J Mitra & Co. Pvt. Ltd., New Delhi, India), VDRL by Carbogen kit, Tulip Diagnostics and malaria by rapid kit test from SD bioline.

Serum was separated from all the blood bag samples and serological tests were performed according to the instruction provided by the manufacturers of respective kits. All seropositive blood bags were considered as positive for TTIS and the blood bags were discarded.

RESULT

A total of 27,606 blood donors including male donors 27,054 and female donors 552 nos. were screened for TTIS, out of which 156 (0.57%) samples were positive for HBsAg and 117(0.42%) donors were anti HCV positive (Table 1). Replacement donors showed more seropositivity 56.4% than voluntary donors 43.5% (Table 1). The majority of the seropositive donors fall between 27-38 yr age group (Table 2).

Males show a higher percentage of prevalence (98%) as compared to female blood donors (table 3). Table 1 and fig.1 shows a decreasing trend of prevalence of HBsAg while HCV shows a rising trend of prevalence of anti HCV antibody among blood donors. Reported sensitivity of J Mitra kits were 100% and specificity 99.9%.

Table 1 shows HBV and HCV positive cases in blood bank, JMCH.

Year	HBsAg +ve (n=27,606)	HBC +ve (n=27,606)	Type of Donor	
			Voluntary	Replacement
2013-14	64 (0.23%)	27 (.09%)	119	154
2014-15	55 (0.2%)	44 (0.16%)		
2015-16	37 (0.13%)	46 (0.17%)		
Total	156 (0.57%)	117 (0.42%)	43.5%	56.4%

Figure 1 shows HBV and HCV positive cases in blood bank, JMCH.

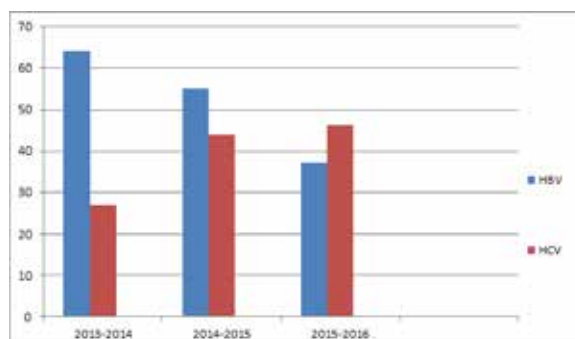


Table 2 shows Age distribution of HBsAg +ve and anti HCV +ve blood donors at JMCH

Age Group	HBsAg +ve (No. and %)	Anti HCV antibody +ve (No. and percentage)
18-27 year	45 (0.16%)	43 (0.16%)

28-37 year	78 (0.28%)	50 (0.18%)
38-47 year	33 (0.12%)	24 (0.08%)
Total	156 (0.57%)	117 (0.42%)

Table 3 shows Gender distribution of HBV and HCV positive blood donors at JMCH

Result	Sex	
	Male (n = 27,054)	Female (n=552)
HBV +ve	153 (0.56%)	3 (0.01%)
HCV +ve	117 (0.42%)	0 (0.00%)
Total	270 (0.98%)	3 (0.01%)

DISCUSSION:

According to India's Drug and Cosmetic Act (1945), each blood unit has to be tested for HBsAg, HCV, HIV, VDRL and malaria [5]. The prevalence of viral carrier rates in the blood donors appear in the data with a decreasing trend in HBV and HCV. In general the prevalence rates of hepatitis B and C were lower among young donors than older donors. In contrast, most of the blood donors in our study are young men (28- 37 age group). It is recognized that this age group is generally involved in misusing of drug, insecure sex and other behavioral habits for the transmission of the virus. Furthermore comparisons of prevalence of transfusion viruses among different male and female blood donors may not be applicable because of high proportion of male donors and exclusion of female donors due to low hemoglobin level.

In the present study, prevalence of HBsAg and anti HCV antibody was 0.57% and 0.42% respectively. These prevalence rates can be compared with other provincial studies from Central Tripoli Hospital and from Libyan National Centre for infectious diseases were 2.2% and 1.2% [6], 3.8% of HBsAg in Syria [7,8], 9.8% and 1.1% in Yemen [9], 2.1% and 13.6% in Egypt [10], more than 5% of HBsAg in Sudan [11], 13.2% and 3.6% in Nigeria [12] and 0.64% and 0.64% in Nepal [13]. Similar comparison of prevalence rates of hepatitis B and C virus of our study is found with different zones in India.

COMPARATIVE PREVALENCE (%) OF HBV & HCV IN DIFFERENT PROVINCES

	Author/Place of study	Year	HBsAg (%)	Anti HCV (%)
1.	Tripoli Hospital & Libyan National Centre for infectious diseases [6]	2013	2.2%	1.2%
2.	Syria [7,8]	2008	3.8%	
3.	Yemen [9]	2002	9.8%	1.1%
4.	Egypt [10]	1993	2.1%	13.6%
5.	Sudan [11]	2011	>5%	
6.	Farola et al. Nigeria [12]	2001-2006	13.2%	3.6%
7.	Shrestha et al. Nepal [13]	2004-2007	0.64%	0.64%

Comparison of seroprevalence (%) of HBsAg and HCV from various studies of India

Different zones	Place	HBsAg (%)	Anti HCV antibody
North India	Delhi [14]	2.23	0.66
	Haryana [15]	1.7	1.0
	Lucknow [16]	1.96	0.85
South India	Karnataka [17]	1.86	1.02
	Andhra Pradesh [18]	1.41	0.84
	Kerala [19]	1.3	1.4
West India	Maharashtra [20]	1.09	0.74
	Jodhpur [21]	3.4	0.28
East India	West Bengal [22]	1.46	0.31
Our study	Assam	0.57	0.42

Although it is difficult to compare the prevalence rate of our study with other provinces, it seems that the rate of HBsAg has decreased dramatically. Introducing hepatitis B vaccine in National immunization programmes, educational programmes, availability of the measure to diagnose hepatitis in health centre and blood banks might explain this decrease. But prevalence rates of HBsAg and HCV of our study shows more or less similar comparison with different zones of India. Such small differences may be explained by methodological

differences between the studies. HCV shows a slight rising trend. . Decreasing trend of HBV and HCV could be due to the fact that screening of blood donors for HBsAg and anti HCV does not totally eliminate the risk of HBV and HCV infection through blood transfusion since donors with occult HBV and HCV infection that lacked detectable levels of HBsAg and anti HCV were screened negative [23]. It is generally accepted that the diagnosis of infection by HBV is based on the presence of the HBsAg in the blood stream [24]. However screening of blood bank donors for HBsAg does not totally eliminate the risk of HBV infection through blood transfusion [25, 26], since absence of this marker in the serum does not exclude the presence of HBV DNA [27]. It is possible that, donors with occult HBV infection, who lacked detectable HBsAg but whose exposure to HBV infection was indicated by a positive anti-HBc and HBV DNA, are a potential source of HBV infection [28]. This emphasizes the need for a more sensitive and stringent screening algorithm of blood donations to improve blood safety.

CONCLUSION:

In conclusion, our analysis showed that there is decreasing trend of HBV infection among blood donors. But it cannot be relied upon because the donors were screened only for HBsAg. On the other hand HCV is clearly on the rise. In spite of donor screening with highly specific and sensitive methods, transmission of virus through transfusion cannot be avoided because virus remains undetectable due to prolonged incubation period, so a person can become potentially infective long before sero-conversion. We must adopt certain measures namely propagation of information and strict screening of voluntary donors. Inclusion of antibody to Hepatitis B core antigen is another sensitive marker in the screening protocol and better donor recruitment. Thus we can reduce the potential sequelae of cirrhosis and hepatocellular carcinoma of this infection in the community. Measures such as more sensitive techniques for effective diagnosis and education to enlighten the population must be implemented.

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