


Original Article

Seroprevalence of Hepatitis B and Hepatitis C Virus among Healthy Blood Donors in Tertiary Care Hospital

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Abstract

Hepatitis B virus (HBV) & Hepatitis C virus (HCV) are transfusion transmissible infections. A study was conducted from September, 2015 to March, 2016 at the Transfusion Medicine Department of Rajshahi Medical College Hospital to determine the prevalence of asymptomatic hepatitis B and C virus in apparently healthy blood donors, were subjected to ELISA for screening of hepatitis B surface antigen and Hepatitis C virus. A total of 200 blood donors were screened, the seroprevalence of HBV & HCV infection was 5.0% & 2.0% respectively. The HBV seroprevalence in male donors was 182/8 (4.4%) and in female donors was 18/2 (11.1%). Four donors were found seropositive for HCV giving a seroprevalence of 2%. HCV seroprevalence in male was 182/4 (2.2%) and no female. Seroprevalence of HCV and HBV were higher in younger donors, service holders, married respondents and middle class donors. To reduce the prevalence of post-transfusion hepatitis and stringent donor screening procedure, routine screening for HBV & HCV in blood banks should be performed using more sensitive methods (ELISA).

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Background

Hepatitis B & C is one of the most common infectious diseases in the world and a major public health problem. It has been estimated that 350 million people worldwide are chronic hepatitis B carriers¹. Hepatitis B virus (HBV) is rapidly spreading in developing countries including Bangladesh. In Indian subcontinent 2-5% general population is chronically infected by hepatitis B virus² but prevalence of HBsAg positive cases in Bangladesh is 5.5%³. Among them prevalence of HBV reported- a value of 8% in intravenous drug users⁴, 9.7% in commercial sex workers⁵ and 5.9% in truck drivers⁶. Hepatitis B is still the most

clinically significant transfusion transmissible infection with a per unit risk 1: 82000⁷ and it is 50 to 100 times more infectious than HIV and important occupational hazard for health workers⁸.

Hepatitis C has approximately 175 million Global Disease Burden which represent almost 3% of the whole population in the world; each year 3 to 4 million new patients with HCV are diagnosed. The prevalence of hepatitis C in Bangladesh is about 1–3% and in professional blood donors is 2.5 %⁹. Many patients remain asymptomatic for years and are only detected on health screening or at the time of blood transfusion¹⁰. A study among 1018 individuals of different age groups and sex with

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varied religious, educational and social backgrounds in Bangladesh were tested for anti-HCV by ELISA where 0.88% tested positive for anti HCV¹¹.

The prevalence of transfusion-transmitted infection in voluntary blood donors is generally much lower than among family/replacement^{12,13,14} and paid donors^{15,16,17}. Each country may establish voluntary blood donor programmes which provide donor information and education and develop strict national criteria for blood donor selection and deferral to exclude prospective donors at the risk of transfusion-transmitted infections¹⁸.

Objectives:

General:

- To determine the prevalence of asymptomatic hepatitis B and C virus in apparently healthy blood donors at in the Rajshahi Medical College Hospital.

Specific:

1. To determine the relation between the prevalence of hepatitis B and C and the sociodemographic variables.
2. To observe the level of ALT of asymptomatic hepatitis B and C positive cases.

Materials and Methods:

The study was a cross-sectional hospital based observational study. Total 200 patients were taken in the Department of Transfusion Medicine, Rajshahi Medical College Hospital, Rajshahi, from September, 2015 to March, 2016. Inclusion criteria included patients those were apparently

healthy blood donors are of both sexes and professional donors were excluded.

Results:

Among 200 blood donors, highest frequency of patients were in the age 31-40 years 56.5%, rest of the patients 22.5% were in the age group 18-30 years, 14.0% patients were 41-50 years. Minimum age 20 and maximum age 53 years. Mean age 35.23±7.91. Majority of the respondents 182(91.0%) were male and 18(9.0%) were female. Male: female ratio 10.1:1. Male respondents were predominant in this series. Regarding educational distribution, 36.0% participants were below SSC, 35.5% were SSC, 12.5% were HSC and 16.0% were graduate and above.

Occupational distribution of the study respondents, 69(34.5%) patients were student, 65(32.5%) patients were service, 42(21.0%) respondents were businessman, 15(7.5%) were day labourer and 9(4.5%) participants were housewife. Among them, maximum participants 82.5% were married and rest 17.5% were unmarried.

Among donors 10 were found seropositive for HBV giving the seroprevalence of 5.0% and 4 were HCV positive giving seroprevalence of 2%. The HBV seroprevalence in male donors was 18/8(4.4%) and in female donors was 18/2(11.1%). 4 donors were found seropositive for HCV giving a seroprevalence of 2%. HCV seroprevalence in male was 18/4(2.2%) and no female. Seroprevalence of HCV and HBV were higher in younger donors, service holders, married respondents and middle class donors.

Table-I: Age distribution of the patients (n=200)

Age group	Number	Percentage (%)
18- 30 yrs	45	22.5
31-40 yrs	113	56.5
41-50 yrs	28	14.0
51-59 yrs	14	7.0
Total	200	100.0
Mean±SD	35.23±7.91	
Range	(20-53) years	

Table-2: Distribution of the study patients according to socioeconomic status (n=200)

Socioeconomic status	Frequency	Percentage (%)
Lower class	36	18.0
Middle class	132	66.0
Upper class	32	16.0
Total	200	100.0

Table-3: HBV and HCV prevalence in healthy blood donors association with socioeconomic demographic variables (n=200)

Sociodemographic	N	HBV positive N No. (%)	HCV positive N No. (%)
Age			
18-30	45	1(2.2%)	0(0.0%)
31-40	113	7(6.2%)	3(2.7%)
41-50	28	2(7.1%)	1(3.6%)
51-59	14	0(0.0%)	0(0.0%)
Total	200	10(5.0%)	4(2.0%)
Sex			
Male	182	8(4.4%)	4(2.2%)
Female	18	2(11.1%)	0(0.0%)
Total	200	10(5.0%)	4(2.0%)
Occupation			
Student	69	4(5.8%)	1(1.4%)
Day labour	15	0(0.0%)	0(0.0%)
Service	65	6(9.2%)	3(4.6%)
Housewife	9	0(0.0%)	0(0.0%)
Businessman	43	0(0.0%)	0(0.0%)
Total	200	10(5.0%)	4(2.0%)
Marital status			
Married	165	9(5.5%)	4(2.4%)
Unmarried	35	1(2.9%)	0(0.0%)
Total	200	10(5.0%)	4(2.0%)
Socioeconomic status			
Lower class	36	0(0.0%)	0(0.0%)
Middle class	132	10(7.6%)	4(3.0%)
Upper class	32	0(0.0%)	0(0.0%)
Total	200	10(5.0%)	4(2.0%)

Table-4: ALT level in HBV and HCV positive patients (n=14)

ALT level	HBV positive (n=10) No. (%)	HCV positive (n=4) No. (%)
Raised ALT	1(10.0%)	1(25.0%)
Normal level	9(90.0%)	3(75.0%)
Total	10(100%)	4(100%)

Among 10 HBV positive cases raised ALT level 1(10.0%) and normal ALT level is 9(90.0%) cases and in 4 HCV positive cases raised ALT level in 1(25.0%) subjects and normal ALT level 3(75.0%) cases.

Discussion

This cross-sectional hospital based descriptive study was conducted among 200 healthy blood donors who attended the Department of Transfusion Medicine, Rajshahi Medical College Hospital, Rajshahi during the study period. The study was aimed to determine the prevalence of asymptomatic hepatitis B and C virus in apparently healthy blood donors.

In present study the overall prevalence of HBV in this study was 5.0%. This result was lower than that obtained by Mwambungu et al. (2015), Kew et al. (1996) and Kasolo et al. (2003)^{19,20}. In other Sub-Saharan African countries, 15% has been reported from Ghana²¹, 8.2% from Ethiopia²², 14.0% from Central African Republic²³, and 8.8% from Tanzania²⁴. However the results are much higher in the Australia with 0.01%²⁵, India with 0.66%²⁶, Iran with 0.56%²⁷, Saudi with 1.5%²⁸, and Turkey with 4.2%²⁹. We also observed a higher male gender predisposition to HBV infection that is consistent with a previous report among Namibian blood donors²⁴.

In present study the overall prevalence of HCV was 4(2.0%). Seroprevalence of HCV in blood donors is reported as 6% in Africa, 1.5% in Japan, 0.6% in USA, 0.24% in Finland and 0.17% in UK^{30,31}. An extremely low prevalence (0.1%) has been reported in the UK and Scandinavia, a slightly higher prevalence (0.2–1%) has been

reported in other European countries, Australia and North America, and the highest prevalence has been reported from Egypt (28%). In Asia the prevalence of HCV in the blood donors has been reported 5.1% from India and 1.5% from Saudi Arabia.^{31,32} In Pakistan seroprevalence varies from 0.7% to 20%.^{30,32,33} Exact seroprevalence of Hepatitis B and C virus throughout country could not be established due to lack of representative study at national level. We also observed the prevalence rates of hepatitis C were higher among younger age group than among older group age group. These results are in contrast with what was obtained by Fathi Abed Al-Gani³⁴ in Jordan,

Detailed epidemiological studies would be needed to further document the prevalence of seroreactivity of Hepatitis B and C in the general population and also to test the hypothesis that have been suggested in the present study. These will help in designing studies for elucidating the natural history, including modes of transmission of HBV and HCV other than parenteral transmission in our population. Larger population vaccinated for Hepatitis B may further lower the prevalence of Hepatitis B. It is important to undertake measures to keep the prevalence of viral hepatitis at low levels.

Conclusion

It is concluded from the study that seroprevalence of Hepatitis B is higher in donors than in Hepatitis

C infection. Prevention is the most important aspect on which we all need to work hard. Blood is one of the main sources of transmission of Hepatitis B and C, hence donor selection is of paramount importance. With vigilant donor's selection and use of sterilized syringes and medical instruments, spread of Hepatitis B and C could be minimised.

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