Prevalence of HBV and HCV in blood donors in Kanpur during the period 1997 through 2005

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Abstract Viral hepatitis transmitted by parenteral route is emerging as a far more dreaded public health challenge than any other illness. We have collected the data of HBV and HCV seropositivity in replacement and voluntary donors in our Blood Bank during the period January 1997 to December 2005. The results were as follows: Total number of cases studied in 1997 to 2005 – 115073 HbsAg positive cases – 1976 (1.7172%) Anti HCV positive cases – 463 (0.4024%) The overall picture is showing a more or less stable prevalence rate of hepatitis cases among blood donors, who were apparently healthy.

Keywords Acute viral hepatitis · Seropositivity · Hep ELISA

Introduction

Acute viral hepatitis is a systemic infection acquired by both enteric and parenteral routes. Hepatitis B and hepatitis C infections have the potential of becoming chronic, sometimes leading to hepatic carcinoma. After infection with hepatitis B virus, the first virologic marker detectable in serum is HbsAg. Circulatory HbsAg precedes elevations of serum aminotransferase activity and clinical symptoms and remains detectable during the entire icteric or symptomatic phase of acute hepatitis B and beyond. Similarly, HCV RNA can be detected within a few days of exposure to hepatitis C virus well before the appearance of anti-HCV and tends to persist for the duration of HCV infection.

We studied the prevalence of HBV and HCV in both replacement and voluntary blood donors during the last nine years in the Blood Bank of GSVM Medical College, Kanpur, Uttar Pradesh.

Material and methods

The present study was conducted at the Blood Bank of GSVM Medical College, Kanpur from January 1997 through December 2005. A standard protocol for donor selection was adopted and blood samples of the donors were subjected to screening for HBV and anti-HCV by Enzyme Linked Immunosorbent Assay (ELISA) along with other mandatory tests.

HbsAg detection by Hep ELISA developed by J. Mitra and co., based on “direct sandwich” principle was employed. The color developed was photometrically read at 450 nm. The cut off value (CoV) was determined by the

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formula $Ncx+0.1$ where Ncx stands for the absorbance of negative control. Similarly, for anti-HCV detection, Qualisa, developed by Qualpro diagnostics was employed. Here, the formula used was $Ncx+0.3$ for calculating the cut off value. Any sample having absorbance more than CoV was considered reactive.

Observations

This study involved results obtained from tests performed on 115073 donors during the nine year period (Table 1). Majority of the donors were males in the age group of 30–40 years. The seropositivity between males and females is almost similar to one another in each of the two infections. (Table 2).

Table 1 Seropositivity in blood donors

Year	No. of tests	Seropositivity			
		HbsAg		Anti-HCV	
		No. of cases	%	No. of cases	%
1997	7451	152	2.04	25	0.34
1998	8409	127	1.51	57	0.68
1999	8841	126	1.43	37	0.42
2000	8943	113	1.26	36	0.40
2001	10647	191	1.79	33	0.31
2002	13628	294	2.16	46	0.34
2003	17865	328	1.84	54	0.30
2004	17856	261	1.46	68	0.38
2005	21433	384	1.79	107	0.49
Total	115073	1976	1.72	463	0.4

Discussion

In India, the incidence of post transfusion hepatitis in multiple-transfused patients is as high as 18–30 percent [1]. In South East Asian Region (SEAR), approximately 14–16 million people are infected annually with HBV while 80 million (about 6% of the population) become carriers [1]. Major part of the chronic carriers secrete hepatitis B surface antigen into blood and other secretions of the body like saliva, semen and vaginal fluid. These carriers are potentially infectious to other seronegative people. Approximately 25% of the carriers are expected to die of chronic sequelae of the infection – cirrhosis and primary hepatocellular carcinoma, thus pronouncing HBV as a major public health problem [2]. Professional blood donors constitute the major high-risk group for HBV infection in India, with a HBsAg positivity rate of 14% [3].

HCV infection in India has a population prevalence of around 01% and occurs predominantly through transfusion and the use of unsterile glass syringes [4]. HCV establishes a chronic infection in 50% to 80% of the cases which are asymptomatic even in the presence of liver damage discernible on biopsy. Chronic HCV is characterized by fluctuating alanine aminotransferase (ALT or SGPT) levels and recognizable changes in liver histology. Chronic infection can lead to cirrhosis and hepatocellular carcinoma. The annual incidence of HCV infection in SEAR countries is largely unknown primarily because over 50% of the infectious cases are asymptomatic [1]. In India, HCV antibodies have been found in 02% of voluntary blood donors [1].

Table 2 Seropositivity in blood donors according to sex

Year	Male donors			Female donors		
	Total	HbsAg+ve	AntiHCV+ve	Total	HbsAg+ve	AntiHCV+ve
1997	7069	148(2.09)	20(0.28)	382	04(1.04)	00
1998	8024	121(1.51)	52(0.65)	385	06(1.55)	01(0.26)
1999	8391	120(1.43)	30(0.36)	450	06(1.33)	01(0.22)
2000	8526	109(1.28)	30(0.35)	417	04(0.96)	00
2001	10148	184(1.81)	29(0.29)	499	07(1.40)	00
2002	13220	284(2.15)	36(0.27)	408	10(2.45)	01(0.24)
2003	17279	318(1.84)	49(0.28)	586	16(2.73)	02(0.34)
2004	17362	252(1.45)	60(0.35)	494	09(1.82)	02(0.40)
2005	20586	276(1.34)	97(0.47)	847	08(0.94)	03(0.35)
Total	110605	1812(1.64)	403(0.36)	4468	70(1.57)	10(0.22)

Figures in parentheses represent percentage

Majority of the positive cases were young individuals, in the reproductive age group (21–40 years) having the potential to spread the infection by heterosexual transmission. Moreover, in comparison to HIV, which is believed to be more dangerous, we found that while its positivity in 1997–2005 period was 0.0195%, that of HBV was 1.7172% and HCV was 0.4024% in the same period. We therefore emphasise on the fact that the prevalence of HBV and HCV infections in this area is higher than that of HIV, requiring greater impetus towards surveillance and preventive measures.

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