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Original Article

Prevalence of occult hepatitis B infection in patients visiting tertiary care hospital

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ABSTRACT

Background: To study the prevalence of occult hepatitis B virus infection (OBI) in a tertiary care hospital.

Methods: 50 HBsAg negative individuals, each amongst blood donors, alcohol dependence syndrome (ADS), alcoholic cirrhotics, hepatitis C virus (HCV)/cryptogenic cirrhotics, end-stage renal disease (ESRD) on maintenance haemodialysis for one year, all malignancies prior to chemotherapy and HIV positive patients were evaluated for anti-HBc total antibody, and blood hepatitis B virus (HBV) DNA amplification in those tested positive.

Results: A total of 60/369 (16.2%) individuals were anti-HBc total positive, 13/50 (26%) of HCV/cryptogenic cirrhotics, 13/52 (25%) of HIV positive, 10/50 (20%) of patients with malignancy, 10/51 (19.6%) and 7/59 (11.9%) of alcoholic cirrhotics and ADS respectively had intermediate prevalence, while, blood donors 5/55 (9.1%), ESRD patients 2/52 (3.8%) had low prevalence. 12 patients (20% of all anti-HBc total positive cases) were HBV DNA positive, 5 HCV cirrhotics (10% of total HCV/cryptogenic), 4 HIV positive (7.69%), 1 each of ADS (1.69%), alcoholic cirrhotics (1.96%) and malignancy group (2%). Blood donors and ESRD patients were negative for HBV DNA.

Conclusion: HBV DNA amplification may under diagnose OBI and anti-HBc total positivity may be a better surrogate marker. Nucleic acid testing of blood donors, however is preferred, especially in high endemic areas. OBI must be looked for in cirrhotics, HIV infection, and patients with cancers prior to chemotherapy, as they may contribute to morbidity in them.

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Introduction

Hepatitis B virus (HBV) is a major public health problem worldwide. Blood transfusion is one of the most common routes for spread of infection. In order to reduce the transmission of HBV, pretransfusion screening of blood donors by serum HBsAg was being carried out. However it was observed that HBV transmission can still occur from HBsAg negative blood donors despite above screening measures. Thus, the term occult

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hepatitis B virus infection (OBI) was introduced.[1] OBI is defined as condition when HBsAg is undetectable in serum, despite the presence of HBV DNA in liver or blood.[2]

There are several mechanisms, which have been hypothesized for OBI are studied and are due to interplay of host and viral factors. These includes: (a) residual low viremia following overt HBV infection due suppression of replication following strong immune response; (b) APOBEC-3 proteins deamination-dependent and deamination-independent actions reduce replication of HBV DNA[3]; (c) genomic integration into host's chromosomes as ccc HBV DNA leading to decrease replication and reduced expression of HBsAg[4]; (d) epigenetic mechanisms[3]; (e) HBV-containing immune complexes are formed, which may cause non detection of HBsAg due to its masking with anti-HBs antibodies; (f) co-infection of HBV with other viruses (hepatitis C virus, HCV), which causes inhibition of replication of HBV; (f) extra hepatic replication of HBV in peripheral blood mononuclear cells.

The clinical significance of OBI includes; (a) can cause fulminant hepatitis due to reactivation of frank infection in immune-compromised hosts like in HIV, patients on Chemotherapeutic drugs[5]; (b) potential risk of transmission of infection through blood donors, transplant donors, and haemodialysis[6,7]; (c) association with development of hepatocellular carcinoma[8]; (d) effects the progression of disease and treatment response in chronic HCV patients; (e) may be associated with cryptogenic liver disease.[7]

Hence, there is a requirement for evaluation of Occult HBV infection (OBI). HBV DNA screening, therefore, carries lot of significance in certain clinical contexts. As HBV DNA is expensive and laboratory intensive; anti-HBc total, as a marker of previous HBV infection, in this situation, becomes an appropriate screening tool.

Material and methods

The study was done at a tertiary care center from June 2012 till Dec 2013. At least 50 patients in each subset with negative HBsAg test (by standard kits) were included. The inclusion subsets of patients were (i) blood donors, (ii) alcohol dependence syndrome (ADS) fulfilling CAGE criteria, (iii) alcoholics with cirrhosis of liver, (iv) patients of HCV or cryptogenic cirrhosis (diagnosis of cirrhosis of liver was considered on the basis of history, clinical signs and symptoms, USG abdomen for liver echotexture, portal vein size, ascites, and or UGI endoscopy for esophageal varices), (v) patients of malignancy prior to chemotherapy, (vi) end-stage renal disease (ESRD) patients on at least one year of haemodialysis (diagnosis of ESRD was considered on the basis of uremic symptoms), GFR <15, which was calculated as creatinine clearance by Cockcroft gault formula and deranged RFT for 3 months or more duration, (vii) HIV positive individuals. The following patient groups were excluded; (i) HBsAg positive individuals in above categories, (ii) age <18 and >75 year, (iii) pregnancy, (iv) patients having overlap between two categories.

All patients were subjected to detailed history, complete physical examination, hematological and biochemical investigations as per protocol, an ultrasonography abdomen for features of cirrhosis was done in all patients for fulfilling inclusion and exclusion criteria; HBsAg and anti-HCV, HIV TEST was done by ELISA in all patients, anti-HBc total was measured in all the patients. HBV DNA analysis was done by real time PCR in patients, who were found positive for anti-HBc total.

Table 1 – Total number of patients and their mean age in each group.

Category	N	Mean age
Blood donors	55	32.67
ADS	59	36.25
Alcoholic cirrhotics	51	47.94
HCV/Cryptogenic cirrhotics	50	56.10
ESRD on MHD for atleast one year	52	50.02
Malignancy patients prior to chemotherapy	50	58.18
HIV positive patients	52	35.81
Total	369	44.87

Results

This study included 369 patients of various categories. The mean age of the patients was ranging from 32 to 58 years (Table 1). A majority of males were noted in the study population more so in the subsets of ADS patients and alcoholic cirrhotics (Table 2). There were 55 blood donors, 59 ADS patients, 51 patients of alcoholic cirrhosis, 50 patients of HCV/cryptogenic cirrhosis and 52 patients of ESRD on maintenance haemodialysis, 50 patients of malignancy before starting chemotherapy and 52 HIV positive patients. A total of 60/369 (16.2%) individuals were found to be anti-HBc total positive, who were negative for HBsAg (Table 3). Maximum prevalence of anti-HBc total was found in HCV or cryptogenic cirrhosis group 13/50 (26%), followed by HIV positive patients

Table 2 – Sex wise distribution of population in each group.

		Group							Total
		Blood donor	ADS	Alcoholic cirrhotics	HCV/Cryptogenic cirrhotics	ESRD on MHD for atleast one year	Malignancy patients prior to chemotherapy	HIV positive patients	
Sex	F	1	1	0	22	16	13	0	53
	M	54	58	51	28	36	37	52	316
Total		55	59	51	50	52	50	52	369

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