

Original Articles

PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AND ANTIBODY IN HEALTHY SUBJECTS AND PATIENTS WITH LIVER DISEASE

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Abstract

The frequency of Hepatitis Bs antigen and antibody was determined in healthy subjects and patients with acute and chronic liver disease.

The frequency of HBs Ag in healthy subjects was 2.9% and HBs Ab 35%. The high prevalence of antibody in normal individuals suggests a constant non-parenteral sub-clinical exposure to hepatitis virus.

Thirty-three per cent patients with acute viral hepatitis, 20% with cirrhosis and 10% with hepatocellular carcinoma were HBs Ag positive, while HBs Ab was detected in 22% cases of acute viral hepatitis and 37% with other liver disorders.

This pattern of prevalence of HBs Ab suggests that hepatitis B virus may be an important etiological agent in acute and chronic liver disease in Pakistan.

Introduction

The prevalence of Hepatitis Bs antigen is high in the tropical and sub-tropical countries (Williams et al., 1972; Williams, et al., 1973). Hepatitis, cirrhosis (Boxall et al.,

1976) and liver cancer (Williams et al., 1975) are also believed to be more common in these areas. It is, therefore, likely that hepatitis virus may be playing an important etiological role in liver disease in these regions. This study was undertaken to determine the frequency of HBs Ag and HBs Ab in healthy subjects and patients with liver disease.

Material and Methods

Sera were obtained from 1318 healthy males, 492 females and 689 patients with acute and chronic liver diseases referred from the departments of Medicine and Radiotherapy, Jinnah Postgraduate Medical Centre between March 1973 and February 1976.

The diagnosis in all the cases was based on clinical history and biochemical findings and was confirmed by liver biopsies.

All sera were screened for HBs Ag using countercurrent immunoelectrophoresis (Zuberi and Lodi, 1974). For the detection of HBs Ab the CIEP, passive haemagglutination (PHA) and radioimmunoassay (RIA) techniques were used.

Results

The results of HBs Ag and HBs Ab screening tests are shown in the accompanying table.

Of 1318 males 46 (3.5%) and 492 females 6(1.2%) had HBs antigenaemia and HBs Ab was detected in 35% of healthy subjects.

HBs Ag was detected in 33% cases of acute viral hepatitis, in 20% cases of cirrhosis and 10% with hepatocellular carcinoma. The antibody was detected in 22% cases of acute viral hepatitis and 37.5% cases with miscellaneous hepatic disorders.

Table: Hepatitis Bs Antigen and Antibody in Healthy Subjects and Patients with Liver Disease

Groups	No. tested	HBs Ag+ve (%)	HBs Ab Positive		
			CIEP	RIA*	PHA**
			No. tested/ No+ve(%)	No. tested/ No+ve(%)	No. tested/ No+ve(%)
Healthy Subjects	1810	52 (2.9)	1810/5 (0.28)	50/17(34)	17/6(35.3)
Acute Viral Hepatitis	369	121 (32.8)	—	—	27/6(22.2)
Chronic Hepatitis	12	1 (8.3)	—	—	2/0
Cirrhosis of the liver	93	19 (20.4)	90/3(3.3)	—	1/0
Hepatocellular carcinoma	81	8 (9.9)	—	—	2/1(50)
Other liver disorders	80	4 (5.0)	77/2(2.6)	—	8/3(37.5)
Obscure Hepatopathy	47	0	—	—	—
Idiopathic Portal Hypertension	7	0	—	—	—

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Discussion

The frequency of HBs Ag is high in apparently healthy population of Indo-Pakistan sub-continent. Sama et al. (1973) reported a frequency of 1.6% in India and Aziz et al. (1971) of 4% in healthy villagers of Punjab. HBs Ab was also detected more frequently than 7.5% (Peterson et al., 1972) to 14.4% (Lander et al., 1971) reported from United States. Anti HBs was detected in 22.1% of 520 normal subjects and 36.8% of 220 commercial blood donors of Delhi (Sama et al., 1973). In this study HBs Ag was detected in 2.9% and HBs Ab in 35% of healthy subjects. This pattern of prevalence of HBs Ag and HBs Ab suggests a constant non-parental sub-clinical exposure to hepatitis B virus.

The frequency of HBs Ag in patients with acute viral hepatitis varies from 12.3% to 80% (Okochi and Murakami, 1968; Gocke and Kavey, 1969). This may be due to variations in the sensitivity of techniques used for the detection of antigen. Nishioka et al. (1975) found a four to eight fold increase in the frequency of detection of HBs Ag if immune adherence haemagglutination and complement fixation techniques are used. Of 64 sera from patients with cirrhosis in Iraq, HBs Ag was detected in 17(26.5%) by CIEP and in 37(58%) by radioimmunoassay (Boxall et al., 1976). Simons et al. (1972) detected HBs Ag in the sera of only 1.9% cases of hepatocellular carcinoma by electroosmodiffusion technique and in 35.3% by immune adherence haemagglutination. In this study the frequency of HBs Ag in hepatitis, cirrhosis and liver cancer using CIEP was 33%, 20% and 10% respectively but it is possible that the frequencies would have been higher if more sensitive techniques were used. It is therefore likely that hepatitis B virus may be playing a significant etiological role in acute and chronic liver disease in Pakistan.

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References

- Aziz, M.A., Siddiqui, A.R. and Khanum, T. (1971) Hepatitis-associated-antigen (HAA) in Pakistan—A preliminary report. *Pak. J. Med. Res.*, 10:47.
- Boxall, E.H., Flewett, T.H., Paton, A. and Rassam, S.W. (1976) Hepatitis-B surface antigen and cirrhosis in Iraq. *Gut*, 17:119.

- Lander, J.J., Alter, H.J. and Purcell, R.H. (1971) Frequency of antibody to hepatitis-associated antigen as measured by a new radioimmunoassay technique. *J. Immunol.*, 106:1166.
- Nishioka, K., Levin, A.G. and Simons, M.J. (1975) Hepatitis B antigen, antigen subtypes and hepatitis B antibody in normal subjects and patients with liver disease; results of a collaborative study. *Bull. W.H.O.*, 52:293.
- Okochi, K. and Murakami, S. (1968) Observation on Australia antigen in Japanese. *Vox Sang.*, 15:374.
- Sama, S.K., Gera, K.L., Gandhi, P.C. and Gandhi, G.S. (1973) Antibody to hepatitis associated antigen in blood donors of Delhi by Sandwich Solid Phase Radio-immunoassay. *Indian J. Med. Res.*, 61:1360.
- Simons, M.J., Yap, E.H., Yu, M. and Sharmugaratnam, K. (1972) Australia antigen in Singapore Chinese patients with hepatocellular carcinoma and comparison groups: Influence of technique sensitivity on differential frequencies. *Int. J. Cancer*, 10:320.
- Williams, A.O. (1975) Hepatitis B surface antigen and liver cell carcinoma. *Am. J. Med. Sci.*, 270:53.
- Williams, A.O., Williams, A.I.O., Buckels, J., Smith, J.A. and Francis, T.I. (1972) Carrier state prevalence of hepatitis associated antigen (Au/Sh) in Nigeria. *Am. J. Epidemiol.*, 96:227.
- Williams, A.O., Smith, J.A. and Francis, T.I. (1973) Hepatite de type B sous les Tropiques. *Afr. Med.*, 105:973.
- Zuberi, S.J. and Lodi, T.Z. (1974) Hepatitis B antigen in blood donors in Karachi, JPMA., 24:126.