

Original Article

Clinical Significance Of Serum HbeAg Among HbsAg Positive Patients

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Abstract

Hepatitis B Virus (HBV) infection is a menace worldwide as a major cause of morbidity & mortality through its consequences viz. acute hepatitis, chronic active, or persistent hepatitis, cirrhosis of liver and primary hepatocellular carcinoma. A total of 127 'HBsAg positive' patients were studied for 'HBeAg' by serum ELISA. Patient's aged between 11 to 60 years with a mean age 27.11. Out of 127 'HBsAg positive' cases 19 (14.96%) were 'HBeAg positive', of which maximum (21.43%) were among <20 years age group. Among 106 male patients 15 (14.155) & among 21 female patients 4 (19.055) were 'HBeAg positive'. Often the initiation of therapeutic approach remains a dilemma in absence of laboratory assessment of viraemic load or presence of HBV DNA through PCR or other DNA hybridization techniques. In such situations, alternatively, a significantly serum 'HBeAg' among 'HBsAg positive' patients may be taken as a surrogate marker for acute viral replication, and, thus apply justifying the initiation of antiviral chemotherapy without delay.

Introduction

Hepatitis B virus (HBV) infection is highly prevalent worldwide as a major cause of morbidity and death. Two billion people globally have been infected with HBV, of whom, 350 to 400 million are chronic carriers. Of those infected, 15% to 40% develop HBV complications, namely cirrhosis of liver or hepatocellular carcinoma (HCC)^{1,2}. There are well-known geographical differences in the prevalence of HBV infection. The dynamics of chronic HBV infection differ considerably between the East (prevalence >10%) and the West (prevalence <1%)³. In most low prevalent areas, HBV infection is acquired mainly during adolescence and mid adulthood, whereas perinatal transmission is the main route in high prevalence.

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According to the World Health Organization report, the prevalence of HBV infection in the South Asian region ranges from 2 to 8%⁴. In 2001, the WHO ranked Bangladesh in the moderate to high risk group of countries for HBV infection⁵.

Most healthy adults (90%) who are infected with hepatitis B virus recover and develop protective antibodies against further HBV infections. A smaller number of infected adults (5-10%) become chronically infected with HBV. Unfortunately, 90% of infants and up to 50% of young children infected with HBV can get rid of the virus and develop a chronic infection⁶. Nearly all infants and most adults who progress to chronic infection have no symptoms during the acute phase. So, diagnosis largely depends on laboratory diagnosis.

Following infection with HBV, classically HBsAg becomes detectable in serum during the incubation period of 3-5 weeks before appearance of clinical symptoms and persists for 2-4 weeks after elevation of serum transaminase level. It disappears in 2-6 months as they recover and after a variable window period, protective anti-HBs antibody appears. Persistence of HBsAg beyond six months after acute infection is accepted as an evidence of chronic infection⁷.

In chronic hepatitis B virus infection, HBeAg may remain detectable for many months and usually for years. In typical cases of acute hepatitis, detection of HBeAg has little value. HBeAg usually become detectable in the serum when HBsAg first appears but disappears within several weeks as acute hepatitis resolves.

However in chronic infection, HBeAg is an important marker of viral replication, infectivity and ongoing liver injury⁸.

Despite the easy availability of a very effective way of prevention, and, a cost effective therapeutic approach, at times, due to paucity of laboratory diagnostic techniques, it becomes difficult to get rid of such a menace leading to its increasing disastrous impact. The aim of this study was to evaluate the serological profile of patients with incidentally detected 'positive HBsAg' to assess the risk factors.

Material and Methods

An observational type of study was conducted at The Diabetic Hospital, Faridpur, during the period of December 2006 to December 2009. Serum samples from 127 patients who attended the Diabetic Hospital Laboratory, Faridpur, with 'positive HBsAg,' detected incidentally, were tested for HBeAg.

In this study, all the serological tests were done by MULTISCAN EX immunosorbant assay analyzer by using test kits from OMEGA DIAGNOSTIC, UK for HBsAg and ATLAS MEDICAL, UK for HBeAg respectively.

Results

A total of 127 'HBsAg positive' patients, (incidentally detected), were selected for this study. Table I shows the age distribution of the selected patients. They were aged between 11 to 60 years with a mean age of 27.11 years.

Table I: Age distribution of study population (n=127)

Age group	Number of HBsAg positive patients with percentage	Number of HBeAg positive patients	Percentage
<20	28 (22.04)	6	21.43
21-30	65 (51.18)	9	13.85
31-40	21 (16.54)	2	9.52
41-50	5 (3.94)	0	00
51-60	8 (6.30)	2	25.00
Total	127 (100.00)	19 (14.96)	

Table II shows the sex distribution of the study patients. Of the 127 'HBsAg positive' patients, 106 (83.46%) were males and 21 (16.54%) were females with a male female ratio 1:0.2.

Table II: Sex distribution of study population (n=127)

Sex	HBsAg positive	HBeAg positive	Percentage
Male	106 (83.46)	15	14.15
Female	21 (16.54)	4	19.05
Total	127 (100.00)	19	

Discussion

The progression to chronic HBV infection characteristically starts with an acute infection, indicated by the presence of HBsAg Positivity for HBeAg, a marker of ongoing viral replication, higher viral load and heightened infectivity, also develops and may remain for months to years⁸. At the same time, those who are 'HBeAg positive' are better responders to antiviral drugs⁸.

The age at acquiring of HBV has a large impact on the likelihood of the disease becoming chronic. The chance of chronic infection is 90% or greater among neonates who become infected with HBV through perinatal transmission. Mothers who are 'HBsAg positive', particularly those who are also 'HBeAg positive', are much more likely than others to transmit HBV to their offspring. Inactive Exposure during adolescence or young adulthood is associated with a 95% or greater likelihood that the disease will be self limiting. HBsAg carriers often bypass the development of cirrhosis of liver but remain at risk for HCC if their viral load is very high.

In this study, out of 127 'HBsAg positive' cases maximum 65 (51.18%) were in 21-30 years age group and lowest 5 (3.94%) were in 41-50 years age group (Table I). Among 127 'HBsAg positive' cases 19 (14.96%) were 'HBeAg positive' and 85.04% were 'HBeAg negative'. Though out of 19 HBeAg positive cases maximum 9 (47.37%) were in 21-30 years age group, maximum 25% were in 51-60 years age group. In a similar study in Pakistan, Khokhar, et al. reported 21.4% were 'HBeAg positive' among incidentally detected 'HBsAg positive' cases and 78.6% were 'HBeAg negative'. This result is similar with the present study⁹.

In this study, out of the 127 'HBsAg positive' patients, 106 (83.46%) were males and 21 (16.54%) were females (Table II). Out of 106 male 'HBsAg positive' case 15 (14.15%) were 'HBeAg positive' and out of 21 female positive cases 4 (19.05%) were 'HBeAg positive'. Out of 19 'HBeAg positive' cases 15 (78.95%) were male and 4 (21.05%) were female. In another study in Pakistan, Khokhar, et al. reported that 73.2% were male and 26.8% were female, which was similar to the present study⁹.

In a study, out of 50 'HBV DNA PCR positive hepatitis B virus carriers' who had elevated serum ALT level, 48 samples were positive for HBeAg. Based on the results it was recommended that detectable HBeAg should be considered as a surrogate marker for HBV DNA in hepatitis

B virus carriers with raised serum ALT in case of non availability of facility to conduct HBV PCR (testing)⁷. In another study, Rabbi, et al. reported that 92.85% 'HBeAg positive' patients with or without raised ALT level were found with active HBV virus replication (HBV DNA)¹⁰.

Traditionally sero-conversion of HBeAg to anti HBe coincides with the decrease or normalization of serum ALT concentration and a very low level of HBV replication¹¹. But, some studies have concluded that presence or absence of HBeAg/anti-HBe may not necessarily reflect the serum HBV DNA concentration, particularly in persistent infection and, thus, absence of HBeAg and presence of anti-HBe poorly correlates with complete loss of HBV DNA from the serum¹².

The limitation of this study was non-availability of PCR test at Faridpur and ALT test of all study cases were not possible. So, from the above discussion, it can be suggested, that, traditional hepatitis B virus serology results should be evaluated from serum HBeAg who are positive for HBsAg and, antiviral therapy should be started. Serum ALT levels should be considered until molecular tests for infectivity like PCR, hybridization for detection of HBV DNA is done.

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