# CORRELATION OF HBeAg AND ALANINE AMINOTRANSFERASE IN CHRONIC HBV CARRIERS

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**Summary**

***Hepatitis B is a major public health problem worldwide, more than 350 million people have chronic infection in which may develop cirrhosis or cancer of the liver. The present study carried out among 61 previously diagnosed chronic hepatitis B patients. Among the 61 cases, 13(21.3%) were HBeAg positive and 48(78.7%) were HBeAg negative. In HBeAg positive cases, 53.85% had elevated and 46.15% had normal ALT levels. In contrast, majority (75%) of HBeAg negative patients had normal ALT levels. There was significance difference between HBeAg and ALT ($p<0.05$). In conclusion, the present study observed that there was positive correlation among HBeAg and ALT status in chronic HBV carriers. The combination of routine serology and biochemical test may be considered as an alternative to HBV DNA in evaluating the state of chronic HBV infection.***

**Key words**

Chronic hepatitis; HBeAg; ALT.

## Introduction

HBV infection is one of the major public health problem through its consequences such as acute hepatitis, chronic active or persistent hepatitis, cirrhosis of liver and primary hepatocelluler carcinoma. Most of the healthy adults (90%) who are infected with hepatitis B virus usually 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 cannot get rid of the virus and develop a chronic infection. Nearly all infants and most of the adults who progress to chronic infection have no symptoms during the acute phase. So, diagnosis largely depends on laboratory investigations. Routine hepatitis B serology includes tests for the detection of HBsAg, HBeAg and their corresponding antibodies, anti-HBs, anti-HBe and anti-HBc [1]. 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 injury [2].

Most of the clinicians still depend on patients HBeAg/anti-HBe status and liver enzymes especially ALT for defining the degree of infectivity [3]. ALT flares reflect a high level of virus replication in chronic HBV carriers if they coincide with related clinical, biochemical, serological and histological alteration [4]. Traditionally seroconversion of HBeAg to anti-HBe coincides with the decrease or normalization of serum ALT concentration and a very low level of HBV replication [4]. So the aim of this study is to correlate HBeAg with ALT for diagnosis of infectivity in chronic carrier patients.

## Materials and methods

The study was carried out in the Department of Microbiology, Chittagong Medical College and Chevron Clinical Laboratory, Chittagong, during the period of January - December 2012. Patients were selected from outdoor patients, Department of Medicine, Chittagong Medical College hospital, Chittagong.

*Inclusion criteria*

Patients who were HBsAg positive for at least 6 months.

*Exclusion criteria*

i) Hepatitis B virus infection less than 6 months.

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ii) Patients co- infected with HIV, Hepatitis delta virus or hepatitis C virus.
iii) Patients having previous antiviral treatment.
iv) Those with hepatocellular carcinoma.
v) Patients with chronic hepatitis due to other causes.
vi) Patient with connective tissue disorder.
vii) Immunocompromised patient.
Samples were collected after taking informed consent from patients or his/her legal guardian.

Under all aseptic precaution, about 5 ml of venous blood were collected from the patients in a sterile vacutainer. After separation of serum ELISA were done for HBsAg and HBeAg detection and rest of serum were preserved at -70$^{o}$C immediately till further use for evalution of ALT.

**Results**

Among 61 study population, ELISA for HBeAg showed positive in 13 (21.3%) case sand 48 (78.7%) were HBeAg negative.

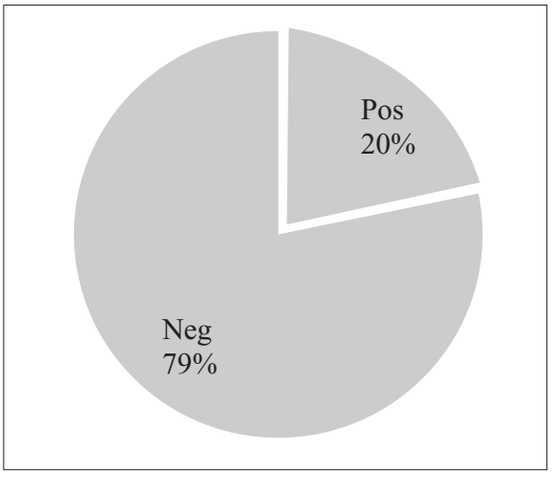


**Figure 1 :** Pie Chart: Distribution of HBeAg (ELISA) results

**Table I :** Serum Alanine Aminotransferase (ALT) profile in chronic hepatitis B carriers (n = 61)

| Serum ALT Status | Result | Percentage (%) |
|---|---|---|
| Increased | 19 | 31.1 |
| Normal | 42 | 68.9 |

Table I shows ALT profile of 61 CHB patients, where 19 (31.1%) had increased level of ALT and 42 (68.9%) had normal level of ALT.

**Table II :** Association between HBeAg status and serum ALT status (n=61)

| HBeAg Status | Serum ALT Status | | Total |
|---|---|---|---|
| | Increased | Normal | |
| Positive | 07 (53.85) | 06 (46.15) | 13 |
| Negative | 12 (25) | 36 (75) | 48 |

Table II shows among 13 HBeAg positive cases, 7 (53.85%) had increased ALT levels and 6 (46.15%) had normal levels. However, among 48 HBeAg negative cases, 36 (75%) had normal and 12 (25%) had increased ALT levels. The association between ALT and HBeAg was statistically significant ($p<0.05$).

**Table III :** Correlation coefficient between HBeAg & serum ALT level

| Correlations Between | Pearson's Correlation Coefficient (r) | Significance |
|---|---|---|
| HBeAg & Serum ALT Level | 0.224 | Positive Correlation |

Table III shows correlation coefficient(r) between HBeAg & serum ALT level was 0.224 which indicates a positive correlation.

**Discussion**

Hepatitis B Virus (HBV) remains an important cause of acute and chronic hepatitis, cirrhosis and hepatocellular carcinoma in endemic areas. Although the incidence of new infection has decreased after the introduction of vaccination programmes, HBV infection is still a significant problem in the world. According to the World Health Organization report, the prevalence of HBV infection in the South Asian region ranges from 2 to 8%. As a South Asian country Bangladesh is considered as intermediate endemic for hepatitis B infection, where the life risk of acquiring HBV infection is 20% to 60%.

In the present study, 78.7% cases were found to be negative for HBeAg. Similar HBeAg negative cases were found by Raihan (2010) and Majid (2011) in Dhaka which were 63% and 88.57% respectively [5,6]. This result indicates a significant increase of HBeAg negative CHB in Bangladesh. This probably indicates that the majorities of HBV positive patients in our region have been infected for a long time and have developed mutation in the pre-core region [7].

In this study, ALT levels elevated in 53.85% and normal in 46.15% of HBeAg positive patients. On the other hand, majority (75%) of HBeAg negative had normal ALT and 25% had an elevated ALT. Similar result was also found by Hasan et al. 2002 in Bangladesh, where 65.8% elevated in HBeAg positive patients and 51.9% in HBeAg negative patients. It may be due to fluctuation of ALT levels and HBeAg status of HBV would change as CHB progresses in some HBeAg negative patients [8]. However, there was significant difference between HBeAg and ALT ($p<0.05$).

**Conclusion**

Detection of HBeAg and ALT status among chronic HBV carriers has positive correlation with some discordance observed among HBeAg and ALT status. The combination of routine serology and biochemical test may be considered as an alternative to HBV DNA in evaluating the state of chronic HBV infection which would be cost saving and prudent step in their initial medical management.

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