

**ORIGINAL ARTICLE**<https://doi.org/10.3329/mediscope.v13i2.91971>**Prevalence of HBsAg in Hepatocellular Carcinoma Patients Admitted at a Tertiary Care Hospital in Bangladesh*****Md. Aslam Hossain¹, Tanvira Haque², Md. Sultan-E-Monzur³, Nadia Sultana Luna⁴, G. M. Abid Kabir⁵, Shantanu Sen⁶****Abstract**

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Background: Hepatocellular Carcinoma (HCC) is one of the most common cancers affecting Asians. In the overwhelming majority of cases, it is associated with chronic hepatitis B infection, which appears to be the cause of 50% to 60% of HCC worldwide. **Objective:** This study aims to see the seroprevalence of HBsAg amongst Hepatocellular Carcinoma (HCC) patients admitted in a tertiary care hospital in Bangladesh. **Methods:** This was a descriptive cross-sectional study conducted over a period of six months at Dhaka Medical College Hospital, where 100 hospitalized HCC patients were selected using a non-randomized sampling method. **Results:** Most HCC patients were in the 4th to 5th decades; the mean age was 48.4 years, with the highest age-specific incidence between the 41-50 years age group. About 76% patients were male. Most of the patients (66%) were from rural areas. In occupational distribution, 30% patients were bus or truck drivers and rickshaw pullers. The majority of patients presented with abdominal pain, weight loss, anorexia, and abdominal swelling, and 50% of them were HBsAg positive. In liver function test, ALT, ALP, and albumin were abnormal in about 90% of patients. In ultrasonography finding most of the lesions (45%) were hypoechoic and present in the right lobe of the liver. **Conclusion:** This study concluded that the prevalence of HBV infection among the HCC patient were 50%, where low socioeconomic middle-aged males are more affected. So, public health awareness must be raised regarding this condition.

Keywords: Hepatocellular Carcinoma, HBsAg, Prevalence.

Introduction

Hepatocellular Carcinoma (HCC) is one of the most common cancers affecting Asians. In the overwhelming majority of cases, it is associated with chronic hepatitis B infection,^{1,2} which appears to be the cause of 50% to 60% of HCC worldwide.³ The earliest epidemiological studies have shown that areas with a high prevalence of hepatitis B infection were also areas with the highest incidence of HCC.^{4,5} For example, countries in the East Asian region - China, Taiwan, Korea, and Japan, where the prevalence rate of hepatitis B infection is very high, were also areas with the highest incidence of HCC. The burden of HCC in this region, in fact, constitutes about 66% of the total number of HCC cases worldwide.⁶ Intensive research has focused on the role of HBV in hepatocarcinogenesis for the past three decades. Increasing evidence points out to two major HBV-specific mechanisms that contribute to the development of HCC. The first is the integration of the viral genome into the host chromosome, causing cis-effects, resulting in loss of tumour suppressor gene functions, and/or activation of tumour-promoting genes. The second mechanism involves the expression of trans-activating factors derived from the HBV genome, which have the potential to influence intracellular signal transduction pathways and alter host gene expression. Integration of HBV DNA into host cellular DNA is crucial during HBV chronic infection by disrupting or promoting the expression of cellular genes that are important in cell growth and differentiation. In addition, expression of HBV proteins may have a direct effect on cellular functions, and some of these gene products can promote malignant transformation. Several HBV genes have been found in infected tumour tissues more frequently than others, including truncated pre-S2/S,⁷ hepatitis B X gene, and a novel spliced transcript of HBV, referred to as the hepatitis B spliced protein.⁸ The proteins expressed from these integrated genes have been shown to have intracellular activities that may account for their association with HCC, including effects on cellular growth and apoptosis. A major player involved in this form of viral transactivation is the X protein (HBx) that displays pleiotropic functions and has been implicated in the malignant transformation of chronically-infected liver cells. Moreover, numerous population-based cohort studies and case-control studies have shown that chronic HBV infection, as evidenced by the presence of hepatitis B surface antigen in serum, is associated with an elevated risk for HCC development.⁹

Materials and methods

This descriptive cross-sectional study was conducted in the department of Medicine and the department of Gastroenterology at Dhaka Medical College Hospital, Dhaka, Bangladesh, where 100 hospitalized HCC patients were selected after fulfilling inclusion and exclusion criteria. The sampling technique was non-randomized, and the total study duration was six months. Informed written consent was taken from each patient after proper explanation.

Inclusion criteria:

- All cytologically (FNAC) or histopathologically confirmed cases of HCC patients.
- Age 18 years and above.
- Participants and or legally accepted guardians, who gave consent and were willing to comply with the study procedure.

Exclusion criteria:

- Patients below 18 years of age.
- Patients with other gastrointestinal or hepatobiliary comorbidities.

Results

Among the 100 cases, 76 were male, and 24 were female, i.e., 76% and 24% respectively. The mean age of patients was 48.4 years, ranging between 18 and 78 years. The higher incidence was seen in the age group of 41-50 years.

Regarding occupation, we found that 30 patients were bus or truck drivers or rickshaw pullers; the farmers and health workers categories consisted of 20 patients each.

Regarding educational background, 35% were illiterate, and 30% had primary education. Most of the respondents belonged to low socioeconomic status (59%), whereas middle and high socioeconomic status were relatively less (36% and 5%, respectively). Among the patients, 66% respondents were living in rural areas, and the rest of them were from urban areas (34%).

Among the clinical features, the most common presentation was abdominal pain (76%), followed by anorexia (66%), weight loss (58%), abdominal swelling (34%), jaundice (20%), and haematemesis/melaena (20%).

In this study, high AFP (>200 ng/ml) was found in 58% cases and low (<200 ng/ml) AFP in 42% cases. The

The familial association of HBV infection in HCC patients was 20%.

In 100 HCC patients, 50 patients were HBsAg positive, of which 40 were male (80%), and 50 patients were HBsAg negative, of which 36 were male (72%).

On ultrasonography findings, most of the lesions were hypoechoic and present in the right lobe of the liver (82%). In Liver function test, AST, ALP, and albumin were abnormal in about 90% of the HCC patients.

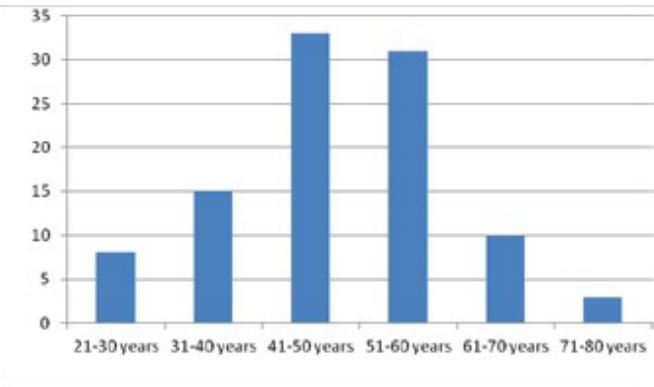


Figure 01: Distribution of HCC patients according to age group

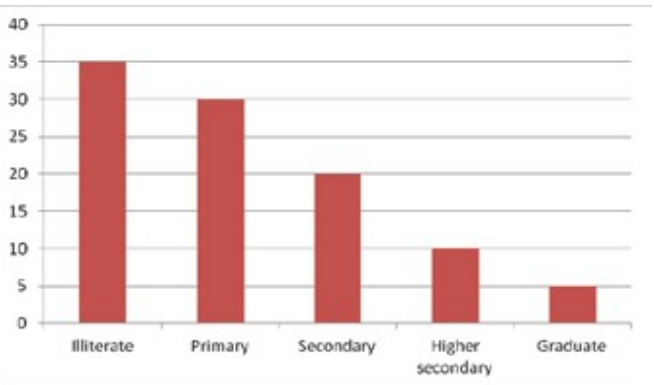


Figure 02: Educational background of the HCC patients

Table 01: Occupational distribution of HCC patients

Occupation	Number with percentage	
Farmer	20	(20%)
Businessmen	10	(10%)
Service holder	10	(10%)
Housewife	10	(10%)
Driver (bus, truck)/Rickshaw puller	30	(30%)
Health worker	20	(20%)

Table 02: Clinical features of the HCC patients

Clinical features	Percent-age
Abdominal pain	76(%)
Anorexia	66(%)
Weight loss	58(%)
Abdominal swelling	34(%)
Jaundice	20 (%)
Haematemesis/ melaena	20(%)
Consciousness level	
Fully conscious and oriented	90(%)
Confused	10(%)



Figure 03: Distribution of the patients according to location

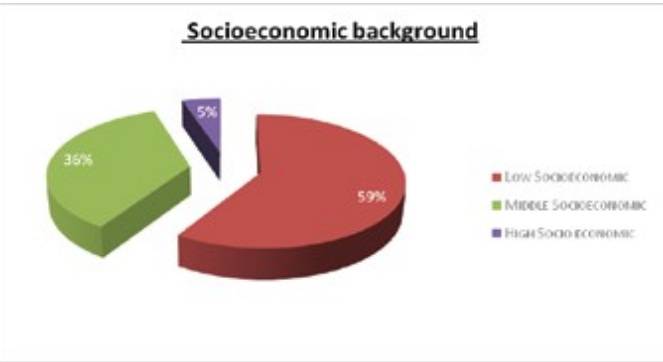


Figure 04: Distribution of the patients according to socioeconomic status

Table 03: HBsAg Positivity (by ELISA) in HCC patients

Sex	HBsAg status		Total
	Positive (%)	Negative (%)	
Male	40 (80%)	36 (72%)	76
Female	10 (20%)	14 (28%)	24
Total	50	50	100

Table 04: Ultrasonography findings of the HCC patients

Traits	Number	Percentage (%)
Site of lesion in the liver		
Right lobe	82	82%
Left lobe	11	11%
Both lobe	7	7%
Echogenicity/Density		
Hypoechoic lesion	45	45%
Hyperechoic lesion	18	18%
Mixed echogenicity	37	37%

Table 05: Parameters of liver function in the HCC patients

Abnormality in Liver function test	Percentage (%)
Elevated AST (U/L)	91
Elevated ALT (U/L)	56
Elevated ALP (U/L)	90
Raised Bilirubin (μmol/L)	45
Abnormal Albumin (g/L)	89

Discussion

Hepatocellular Carcinoma (HCC) is a fatal disease. It is the third most common cause of death from malignancy in the world. An estimated 478,000 men and 217,000 women died from this cancer in 2008, and there is a similar geographical distribution of mortality rates, as well as incidence rates, due to its very high overall fatality ratio.¹⁰

The incidence rate starts to increase after the age of 40 years, i.e., the highest peak is between 41 and 50 years. Below 40 years, the incidence rate is about 23%. This is possibly due to perinatal transmission of HBV infection.

This finding is similar to an Asian study in Hong Kong by M-F Yuen et al.¹¹ in 2009, which revealed that the incidence rate starts to increase from the age of 35 to 40 years, peaking in the sixth and seventh decades of life for men, possibly later for women. These observations on age-specific incidence have obvious implications for targeting a population for HCC screening programs.

In our study, we found that among the respondents, males were 76% and females were 24%. This observation is similar to a study in Japan by Jin-Lin Hou et al. in 2009 which revealed that the male-to-female ratio for HCC is 3:1, except for older women in Japan. In occupational distribution, we found that drivers (bus, track) / rickshaw pullers are more affected than other professions, e.g., 30%. It might be due to poor socioeconomic conditions, lack of health knowledge, lack of screening programmes, exposure to commercial sex workers without protection, etc.

In our study, the maximum number of affected people were illiterate (35%) or had only completed primary school (30%). This might be due to the maximum population coming from rural areas and our study population taken from a government hospital, where maximum belonging to the low or lower middle classes. Regarding clinical features, this study reveals that common clinical presentations included abdominal pain (76%), anorexia (66%), weight loss (58%), abdominal swelling (34%), jaundice (20%), and GI bleeding (20%). This observation, described by Jin-Lin Hou et al in 2009 that patients with background cirrhosis who develop an acute onset of anorexia, weight loss, abdominal pain, ascites, and other states of decompensation should strong suspicion of malignancy.¹²

Regarding family history, in the family background of HBV infection, mother and father were equally affected, about 6% cases, and the next commonly affected family members are brothers and sisters (4%).

In our study, the main etiologic factor is HBV infection, which is about 50%. This observation was also found in another study conducted in the Asia-Pacific region, described by Omata et al.¹³, who found that the main agent for HCC in Asia is chronic HBV infection. In most countries, this usually accounts for 70-80% cases, except Japan, where it only accounts for 11% cases, while chronic hepatitis C accounts for 80% cases. Singapore appears to be another exception, where CHB (chronic hepatitis B virus) infection accounts for only one-third of cases of HCC. Nevertheless, with the implementation of universal HBV vaccination in most of the Asia-Pacific countries, the authors anticipate a fall in the incidence of HCC in the coming 20-30 years. Prevention of HCV from medical causes should be screened.

Finally, although Chronic Hepatitis B (CHB) is the major cause for HCC, comprehensive data on the role of aflatoxin, food and water-borne toxins, alcoholism, metabolic syndrome, especially obesity and diabetes, on the development of HCC are lacking in the Asia-Pacific region. Further studies are recommended to delineate the exact risk for HCC in the future.

In combination with imaging studies, alpha-fetoprotein (AFP) is the most common laboratory examination utilized in Asia to help make a definitive diagnosis of HCC after hepatic tumors are detected by imaging studies. However, different centers used different cut-off values of AFP. If a lower cut-off value is adopted, i.e., >200 ng/ml, a larger number of HCC patients will be diagnosed, as in Indonesia, 49% and 77% in the Philippines. When AFP >400 ng/ml is used as a diagnostic cut-off, the diagnosis is lower; only 36% in India, 41% in Indonesia, and 42.8% in the Philippines, respectively. In Vietnam, only 46.7% of HCC patients have elevated AFP >100 ng/ml.¹⁴

According to our study, if the cut-off value is adopted >200 ng/ml, about 58% patients have HCC. And if the cut-off value is adopted >400 ng/ml, it falls to about 43% patients.

Conclusion

This study concludes that the prevalence of HBV infection among the HCC patient were 50%, where low socio-

economic middle-aged males are more affected. Though our sample size was relatively small, it was purposive sampling. Also, the sample was taken from a single institution, so the result might not show the actual scenario of our whole country. Still, this study will give an opportunity to explore the prevalence of HBsAg in HCC and also search for the underlying etiology among the Bangladeshi population on a larger scale. Improvement of surveillance programs and health awareness about the consequences of HBV infection may reduce the complications of HBV infection, especially HCC.

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