SEROPREVALENCE OF HEPATITIS B VIRUS INFECTION AMONG PATIENTS ATTENDING A TERTIARY CARE CENTRE IN NORTH-EAST INDIA

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ABSTRACT

BACKGROUND

Hepatitis B infection is a major global health problem. The seroprevalence of Hepatitis B virus infection among general population attending at a tertiary care hospital is useful in assessing the magnitude of HBV infection and helps in devising preventive measures. The co-infection of Hepatitis B or Hepatitis C virus with HIV accelerates disease progression and may complicate the management of patients infected with HIV. This study was designed to determine hepatitis B virus infection among patients attending tertiary care centre in North-East India.

MATERIALS & METHODS

A total of 11399 serum samples, collected from patients attending outpatient or inpatient departments and ART centre, were screened for HBsAg using 3rd generation ELISA (Qualisa HBsAg, Qualpro Diagnostics, Goa, India) in this retrospective study.

RESULTS

Seroprevalence of HBsAg was 1.23%. Seropositivity was seen more in males (2.2%) as compared to females (0.89%). Among males, highest occurrence was found in the age group of 21-30 (3.29%) years followed by 31-40 (2.94%) years and 41-50 (2.37%) years. Among females, highest prevalence was observed in age group of 51-60 (1.39%) years followed by 61-70 (1.15%) years and 41-50 (1.13%) years.

CONCLUSION

Present study showed that the overall rate of HBsAg positivity in our center was 1.23%. Males and younger age group were found to be more affected probably due to horizontal transmission.

KEY WORDS

ELISA, Hepatitis B, HBsAg, Sero-Prevalence.

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BACKGROUND

Hepatitis B virus infection (HBV) is a common public health problem. About 2 billion people (or 30% of the world population) have serological evidence of current or past infection with hepatitis B virus. It is known to be the 10th leading cause of death and HBV related hepatocellular carcinoma is the 5th most frequent cancer worldwide.^[1] An estimated 350 million people harbour chronic infection. The number of HBsAg carriers in India have been estimated to be over 40 million.^[2] Major complications of chronic HBV infection are liver cirrhosis and primary cell carcinoma.

According to WHO and NCDC countries are classified as having high (8% or more), intermediate (2-7%), or low (less than 2%) HBV endemicity based on the prevalence of hepatitis B carrier state in the general population.

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India is at the intermediate endemic level of hepatitis B, with hepatitis B surface antigen prevalence between 2% and 7% among the populations studied.

The primary routes of transmission are perinatal, early childhood exposure, sexual contact, and per cutaneous exposure to blood or body fluids (i.e. injections, needle stick, blood transfusion). The hepatitis B surface antigen (HBsAg) in serum is the first sero-marker to indicate active HBV infection, either acute or chronic.^[3]

The important source of infection is blood of a carrier. It is a heat stable and can survive outside the body for at least 7 days, as little as 0.00001ml of infected blood or infected material by Hepatitis B virus can be an infectious. The incubation period is 30 to 180 days. The virus may be detected within 30 to 60 days after infection and can persist and develop into chronic hepatitis B.^[2] Virus may also be present in body fluids and excretions (Saliva, breast milk, semen, vaginal secretion, urine & bile) and faeces. A large population of patients suffering from hepatitis B may be asymptomatic and can transmit the disease to healthy population.

Human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) have similar routes of transmission, namely through blood and blood products, sharing of needles to inject drugs and sexual activity.^[4,5] Co-infection of HBV and HCV in HIV positive patients is

associated with reduced survival and an increased risk of progression to severe liver diseases with higher susceptibility towards hepato-toxicity due to antiretroviral therapy.

The present study was undertaken to determine the seroprevalence of HBV infection among patients attending a tertiary care centre in North-East India and to assess the demographic profiles of seropositive patients/individuals. This study also aimed to highlight the presence of co-infection of HCV & HIV, if any, among HBV infected patients.

MATERIALS & METHODS

This is a hospital-based, retrospective descriptive study conducted in the department of Microbiology from July 2017 to June 2018. The study includes patients of all age groups & both sexes attending various outpatient departments or admitted in the wards of medicine, surgery, orthopedics, obstetrics and gynaecology or pediatrics, who were undergoing HBsAg test as part of routine preoperative screening or for diagnostic purposes. HIV positive clients referred from ART centre for HBV and HCV screening were also included.

At least 5 ml of blood was collected aseptically by venepuncture into sterile, disposable vials without anticoagulants and labelled with patient identification details. Serum was separated by centrifugation at a speed of 3000 rpm for 10 minutes and placed in sterile serum storage vials. All the serum samples were tested for HBsAg using 3rd-generation ELISA (Qualisa HBsAg, Qualpro Diagnostics, Goa, India) following standard protocol and manufacturer's instructions with adequate quality control. Samples were considered reactive according to the manufacturer's specifications. However, any doubtful or indeterminate results were excluded from analysis. HBsAg positive samples were further subjected to qualitative detection of anti-HCV antibody using 3rd generation ELISA (Qualisa HCV, Qualpro Diagnostics, Goa, India)

Analysis of data was done using descriptive statistics using such as percentage.

RESULTS

A total of 11399 serum samples were collected and processed for HBsAg during the study period of 12 months. Among these, 2901 (25.44%) and 8498(74.55%) were from male and female patients respectively (Table 1). The prevalence rate of HBV infection was found to be 1.23%. The prevalence of hepatitis B virus infection was found to be higher amongst males (2.2%) as compared to the female (0.89%).

In this hospital-based study, highest occurrence of HBV infection among males was observed in age group of 21-30 (3.29%) years followed by 31-40 (2.94%) years and 41-50 (2.37%) years (Table 2). Among females, highest prevalence was found in age group of 51-60 (1.39%) years followed by 61-70 (1.15%) years and 41-50 (1.13%) years (Table 2).

In this study, co-infection of HBsAg and HCV was observed in 0.096% (11/11399). HIV co-infection with HBsAg and HCV was seen in 1.6% and 19.1% respectively. The distribution of HBV and HCV co-infection in patients infected with HIV is shown in Table 3.

Gender	Total No. of Sera Tested	HBsAg Positive (%)
Male	2901	64 (2.2)
Female	8498	76 (0.89)
Total	11399	140 (1.23)

Table 1. Gender Seroprevalence of HBsAg

Age Group (Years)	Total Samples Tested	Gender		HBsAg +ve		Total HBsAg +ve (%)
		Male	Female	Male (%)	Female (%)	
0-10	284	178	106	0	0	0
11-20	1322	211	1111	4 (1.89)	5 (0.45)	9 (0.68)
21-30	3814	364	3450	12 (3.29)	29 (0.84)	41 (1.0)
31-40	2349	510	1839	15 (2.94)	18 (0.97)	33 (1.4)
41-50	1474	590	884	14 (2.37)	10 (1.13)	24 (1.62)
51-60	1025	451	574	9 (1.99)	8 (1.39)	17 (1.65)
61-70	708	361	347	7 (1.93)	4 (1.15)	11 (1.55)
> 70	423	236	187	3 (1.27)	2 (1.06)	5 (1.18)
Total	11399	2901	8498	64 (2.2)	76 (0.89)	140 (1.23)

Table 2. Age & Gender Distribution of Screened Samples

Gender	HIV +ve	HBsAg +ve	Anti HCV Ab +ve
Male	99	1 (1.2%)	29 (29.29%)
Female	115	2 (1.9%)	12 (10.4%)
Total	214	3 (1.6%)	41 (19.1%)

Table 3. Co-Infection of HIV with HBV & HCV

DISCUSSION

A total of 11399 serum samples tested for detection of HBsAg. Sero-prevalence of HBsAg in our center is 1.23% which is lower than most of the Indian studies (2-8%). Sharma et al. have reported the prevalence of 2.31% among general population attending OPD at a tertiary care hospital.^[6]

In this present study, higher HBV prevalence was observed among in males (2.2%) as compared to the females (0.89%) in females. Findings were in concordance with other earlier studies.^[7-11] Patel et al. showed the intermediate level of prevalence of 2.67%, in younger age group affecting more males.^[11] Male predominance of HBsAg virus infection as compared with the female might be probably due to the higher exposure of male to occupational HBV indicating horizontal transmission, which may be due to unsafe injection practices, intravenous drug abuse, unsafe sexual practices and also probably because females clear the HBV more efficiently as compared to males.^[2, 12]

Among males, highest occurrence was found in age group of 21-30 (3.29%) yrs. followed by 31-40 (2.94%) yrs and 41-50 (2.37%) yrs. Similar results were noted by Sood et al and Patel et al.^[8, 11] However, Tripathi et al observed highest prevalence in 31-40 years followed by 21-30 years, so it can be concluded that highest prevalence in 21-40 years indicating horizontal transmission.^[10]

Among females, highest prevalence was found in age group of 51-60 (1.39%) years followed by 61-70 (1.15%) years and 41-50 (1.13%) years Similar results were noted by Patil et al and Quadri et al.^[13, 14]

In our study, co-infection of HBV and HCV was observed in 0.096% which was lower than that of Desikan et al (1.89%).^[15] Of the total 214 HIV infected individuals included in our study, co-infection with HBV and HCV was found in 1.6% and 19.1% respectively. The higher prevalence rate of HCV in HIV positive patients in comparison to the rate for HBV positivity in HIV infected patients in our centre could be attributed to diverse factors such as increase in the rate of drug addiction, lack of vaccine for HCV. However, co-infection of HIV was noticed more in HBV rather than HCV in most of the Indian studies.^[16,17]

CONCLUSION

Seroprevalence of Hepatitis B infection (1.23%) was found to be slightly lower when compared to other parts of the country. Males especially in younger age group were found to be more affected. Our study re-emphasizes need for adequate public awareness to tackle this silent epidemic by improving prevailing health care practices and proper counselling.

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