

## Screening of Hepatitis B and Hepatitis C in a tertiary care center of Bihar

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Received: 27-11-2021 / Revised: 11-12-2021 / Accepted: 12-01-2022

### Abstract

**Introduction:** It is estimated that 325 million people worldwide are living with chronic HBV or HCV infection. The risk of chronicity is more in neonates (90%) and young children (20-60%) than in infection that is acquired in adulthood (5%). **Methodology:** This study was conducted at Jawahar Lal Nehru Medical College & Hospital, Bhagalpur, Bihar, India by the Department of Microbiology during the study period of 1 year from January 2021 to December 2021. Patients' samples were obtained from various outdoor patient departments & Indoor wards and were tested for HbsAg or Anti HCV antibody on Enzyme linked immunosorbent assay (ELISA) test. Five milliliter of blood was collected and serum was separated which was divided into two aliquots; one was used for HbsAg and the other was used for anti-HCV antibody for ELISA testing. In total, 1000 samples were collected and tested for HbsAg and anti HCV antibody. Prior approval was obtained from the Institutional Ethics Committee. Collected data was tabulated and analyzed using SPSS ver. 21.0. Collected data was tabulated and analyzed using SPSS ver. 21.0. **Results:** A total of 1000 samples were collected and tested during the study duration. On analysis of collected samples, the prevalence of HbsAg was 6.12% which is higher in comparison to other parts of India where usually maximally it has been reported to around 4%. In case of anti HCV antibodies the prevalence was 5.89% which is greater than expected in India where it was thought to be around 1%. **Conclusion:** Availability of sufficient recent estimates of HBV or HCV prevalence is necessary to evaluate control measures and health care planning.

**Key Words:** Screening, Hepatitis B, Hepatitis C

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### Introduction

Viral hepatitis has been now recognized as a major public health problem as it caused 1.34 million deaths in 2015, equivalent to deaths caused by tuberculosis and higher than those caused by HIV[1]. It is estimated that 325 million people worldwide are living with chronic HBV or HCV infection[2]. Viral hepatitis is increasingly being recognized as a public health problem in India. Hepatitis B surface Antigen (HbsAg) positivity in the general population ranges from 1.1% to 12.2%, with an average prevalence of 3-4%. Anti-Hepatitis C virus (HCV) antibody prevalence in the general population is estimated to be between 0.09-15%[3]. Based on some regional level studies, it is estimated that in India, approximately 40 million people are chronically infected with Hepatitis B and 6-12 million people with Hepatitis C[4]. Chronic HBV infection accounts for 40% of Hepatocellular Carcinoma (HCC) and 20-30% cases of cirrhosis in India [3]. Chronic HCV infection accounts for 12-32% of HCC and 12-20% of cirrhosis[3]. India has about 3 million to 9 million persons with active HCV infections[5]. All key and bridge population groups under HIV infections are especially vulnerable to viral hepatitis infections too. There include groups like recipients of multiple blood/ blood products transfusion, patients on hemodialysis, People Who Inject Drugs, Males having sex with males, female sex workers, sexual partners of infected people, prisoners, migrants and truckers etc. Also, high risk population for viral hepatitis include close first degree relatives and family members: mother, siblings, spouse and children, of persons affected with viral hepatitis. The other populations for both hepatitis B and C include those who have received blood or blood products especially before implementation of hepatitis C testing at a large scale in India; i.e. before 2001. Hepatitis B and C infections have long gestation periods before the disease progresses to advanced stages

resulting in liver cirrhosis and liver cancer, resulting in mortality if treatment is not provided in time. Hepatitis B infection is caused by HBV DNA (deoxyribonucleic acid) virus which belongs to Hepadnaviridae family and can be either acute or chronic[6,7]. Acute hepatitis B is marked by acute inflammation and hepatocellular necrosis whereas chronic hepatitis B infection is defined as persistent HBV infection, as evidenced by existence of hepatitis B surface antigen [HbsAg] in the blood or serum for longer than six months, with or without associated active viral replication and indication of hepatocellular injury[7]. The risk of chronicity is more in neonates (90%) and young children (20-60%) than in infection that is acquired in adulthood (5%)[8,9]. There is a serious dearth of data regarding the true prevalence of HBV in India, HbsAg positivity has been reported to range between 2% and 8% in most studies[10-12]. The most widely quoted figure of carrier rate in India is 4.7% with an estimated carrier population of 56.5 million[11]. Many of these studies are based on data from blood banks and may not truly reflect the national prevalence. The prevalence of chronic hepatitis C virus (HCV) infection has been estimated at between 1.2% and 1.7% in the adult global population whereas estimated figure in India is around 1% but there are no discrete studies for the same. In India, in absence of discrete studies, estimated prevalence rate of hepatitis C is 1%[13]. HCV, a single stranded RNA virus and in acute phase, patients' presents clinically with symptoms of generalized Myalgias, nausea, vomiting and upper abdominal discomfort. The patients who develop chronic hepatitis C, after a gap of ten to twenty years may develop cirrhosis in 5-20 % of patients and around 25% of them can advance to End stage liver disease and hepatocellular carcinoma[14]. HCV has seven genotypes 1-7 and in India, genotype 3 is more common in South whereas Genotype 4 is common in North. The initial screening test is Anti HCV antibody test which is confirmed with HCV RNA quantitative, a polymerase chain reaction test[13].

### Methodology

This study was conducted at Jawahar Lal Nehru Medical College & Hospital, Bhagalpur, Bihar, India by the Department of Microbiology

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during the study period of 1 year from January 2021 to December 2021. Patients' samples were obtained from various outdoor patient departments & Indoor wards and were tested for HbsAg or Anti HCV antibody on Enzyme linked immunosorbent assay (ELISA) test. Five milliliter of blood was collected and serum was separated which was divided into two aliquots; one was used for HbsAg and the other was used for anti-HCV antibody for ELISA testing. In total, 1000 samples were collected and tested for HbsAg and anti HCV antibody. Prior approval was obtained from the Institutional Ethics Committee. Collected data was tabulated and analyzed using SPSS ver. 21.0.

## Results

A total of 1000 samples were collected and tested during the study

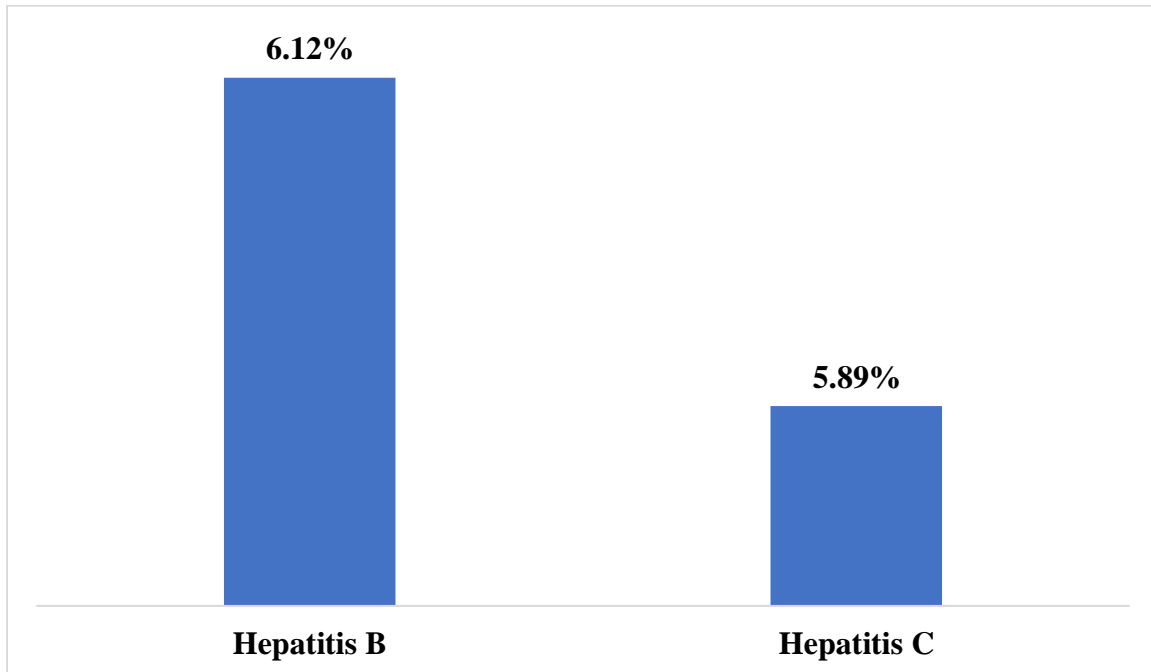


Fig. 1: Column distribution of patients who screened positive

## Discussion

Though reports on the prevalence of HBV and/or HCV infection among blood donors[15] and in patients with certain clinical conditions[16,17] are available, prevalence among general population in India is sparse. Study on the prevalence of HBV and HCV infection is needed to understand its epidemiology and to create strategies to improve public health which may help in the disease prevention and control[18].

There is a considerable variation in the geographical distribution of HCV[19]. The overall prevalence of HCV in our study was 5.89%, which is strikingly much higher than study reports from Bangladesh[20] and Tamil Nadu[21]. In India, very few studies are available on the prevalence of HCV in general population. Community based studies from West Bengal[22], Andhra Pradesh[23] and Arunachal Pradesh[24] showed the HCV prevalence of 0.87%, 1.4% and 7.89% respectively, and the first two had lower prevalence in comparison to our study whereas from Arunachal Pradesh had prevalence on higher side.

HBV prevalence in different population has been shown to vary widely from 0.1% in the developed countries to 20% in the developing nations[25]. In our study the overall prevalence of HBV was 5.23%. In 1995, the average estimated carrier rate of HBV in India was 4%[26]. A community based study on HBV prevalence in urban and rural subjects in Tamil Nadu documented 5.7% of HbsAg positivity[27], which is comparable to our study report. In contrast, studies from West Bengal[28] and Kanpur[25] showed that 2.97%

duration. The age of the patients ranged from 12 to 72 years with a male preponderance. The male to female ratio observed in the study was 2.1:1. Majority of the samples were collected from the medical OPD and admitted patients under the Department of General Medicine. None of the patients reported prior history of hepatitis B or C.

On analysis of collected samples, the prevalence of HbsAg was 6.12% which is higher in comparison to other parts of India where usually maximally it has been reported to around 4%. In case of anti HCV antibodies the prevalence was 5.89% which is greater than expected in India where it was thought to be around 1%.

and 2.25% were positive for HbsAg, respectively and this is less than which was revealed in our study. The data on the general population prevalence of HBV or HCV are limited in India. In comparison with study reports from India, we have observed overall higher prevalence of HCV and HBV infection.

## Conclusion

Prevalence of both of them is almost higher than previous reported studies and needs more dedicated efforts for curbing the menace of these deadly diseases. Availability of sufficient recent estimates of HBV or HCV prevalence is necessary to evaluate control measures and health care planning.

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**Conflict of Interest: Nil Source of support: Nil**