

INCIDENCE OF HEPATITIS B & C INFECTION IN TERTIARY CARE HOSPITAL OF CENTRAL INDIA.



Microbiology

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ABSTRACT

Introduction-Viral hepatitis is one of the major public health concerns worldwide. Hepatitis B virus (HBV) and hepatitis C virus (HCV) are of great concern due to their association with cirrhosis and hepatocellular carcinoma.

Aims & Objectives-To determine the frequency of Hepatitis B surface antigen and anti-HCV antibodies in patients coming to a tertiary care teaching hospital and to estimate the occurrence of co-infection with hepatitis B virus and hepatitis C virus

Method- This prospective study included serum samples which were subjected to detection of HBs antigen and anti-HCV antibodies using rapid immunochromatographic card tests, which were further confirmed by Enzyme Linked Immunosorbent Assay (ELISA).

Results- Out of total of 500 cases, the seropositivity of HBs antigen and anti-HCV antibodies was found to be 3.6% (18/500) and 3% (15/500) respectively. Male to female ratio for hepatitis B and hepatitis C was 2:1 and 3:1, respectively. The commonest risk factor associated with seropositivity of HBV was intravenous drug use, followed by blood / blood components transfusion. Hepatitis C infection was most seen with blood / blood components transfusion, followed by intravenous drug use.

Conclusions: Counseling and health education regarding the safe injection practices, safe sexual practices, screening of blood / blood products and vaccination against HBV are the essential steps to combat viral hepatitis.

KEYWORDS

Anti-HB Vanti-bodies, HBV, HBsAg.

INTRODUCTION:

Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are of public health importance worldwide, due to their burden of liver-related morbidity and mortality.[1] HBV and HCV are endemic in India and are culprit for causing acute hepatitis. About 50%-70% cases of acute hepatitis lead to chronic liver disease (CLD), particularly cirrhosis and hepatocellular carcinoma.[2-4] In India, there are estimated 43-45 million hepatitis B surface antigen carriers and 3%-4% of the population is infected with hepatitis B virus.[5] Hepatitis C virus is one of the major cause of post-transfusion hepatitis and results in CLD. It has been analyzed that approximately 1.8%-2.5% population is presently infected with HCV in India.[6] The unscreened blood / blood products transfusion, unsafe injection practices, PWID (People who inject drugs) and multiple sexual partners, play a significant role in transmission of HBV and HCV, thereby increasing their prevalence.[7] The present study was undertaken to determine the frequency of seropositivity of HBs Ag and anti-HCV antibodies in a tertiary care hospital to analyze their co-infections and identify the risk factors associated with their transmission.

MATERIALS AND METHOD:

The prospective study was carried out in the Department of Microbiology, over a period of three months, from June 2020 to August 2020. The study included all blood samples received, in the Microbiology Laboratory, for detection of HBs Ag test (Hepatitis B surface antigen) and anti-HCV antibodies, from patients attending various out - patient departments and patients admitted in different wards and intensive care units of our tertiary care hospital. Sample Collection: 5 ml of venous blood sample was collected from the patients by a trained phlebotomist in red top vacutainer. Serum Separation: Whole blood sample could clot for 60 minutes at room temperature. Once the clot had formed, sample was centrifuged for serum separation. Serum Storage: Serum samples were stored at 2-8°C for up to 1 week or at -20°C for up to 1 month. Sample Processing: (1) Detection of HBs Ag Screening of HBV infection was done by detection of HBs Ag using rapid immunochromatographic card test as per the manufacturer's instructions. Samples reactive by card test were further confirmed by ELISA for HBsAg according to kit's instructions. (2) Detection of Anti- HCV Antibodies: Screening of HCV infection was done by detection of Anti- HCV antibodies using rapid immunochromatographic card test as per the manufacturer's instructions. Samples reactive by card test were further confirmed by third generation ELISA according to kit's instructions. Statistical Analysis: Study was done using retrospective data collected over two years of duration. All data are expressed as absolute numbers and percentage to serve the purpose of descriptive analysis in current study.

Categorical data were presented in tabular form along with frequency and percentage.

RESULTS:

Blood samples were received in the laboratory from a total of 500 patients, for the detection of both HBs Ag and anti-HCV antibodies. Out of total of 500 cases, the serum samples reactive for only HBs Ag by immunochromatographic card test were 18, the results of which were found to be concordant with hepatitis B ELISA. The serum samples reactive for only anti-HCV antibodies by card test were 15, all of which were also reactive by hepatitis C ELISA.

Table 1-Risk factors associated with seropositivity of HBV

Risk factor	Percentage
Intravenous drug use	40
Blood/bld. Components transfusion	28
Multiple sexual partners	21
Needle stick partners	8
Hemodialysis	3

Table 2- Risk factors associated with seropositivity of HCV

Risk factor	Percentage
Blood/bld. components transfusion	40
Intravenous drug use	26
Multiple sexual partners	16
Needle stick injuries	7
Hemodialysis	8
Tattooing	3

DISCUSSION:

Viral hepatitis is primarily associated with life threatening complications such as liver cirrhosis, primary hepatocellular carcinoma, hepatic fibrosis and steatosis.[3-5] Hepatitis B virus and hepatitis C virus are the blood-borne pathogens, propagating around the globe, including in India. Due to the shared mode of parenteral transmission, co-infections with HBV and HCV are common in highly endemic areas and in high risk population.[8] India holds for the significant proportion of the global hepatitis B burden, accounting for 10-15% of HBV carrier state. India has been recognized as an intermediate endemic country, with a 3.7%-point prevalence of HBV. It has been estimated that annually, one million Indians are at risk of getting hepatitis B, and about 100,000 deaths occur due to HBV infection.[9] In the present study, the seropositivity of HBV infection was found to be 3.6%. In 2018, a study done by Agarwal L et al. reported the seroprevalence of HBs Ag in hospital-based population to be 3.9% in Uttar Pradesh. In northeast India, Roy A et al. had

documented 17.4% seroprevalence of HBV in 2017.[10] A systematic review and pooled analysis by Schweitzer et al., covering 161 countries, reported HBsAg prevalence in India to be 1.46%.[11] In our study, the seropositivity of HCV infection was found to be 6.1%. Agarwal L et al. had reported the seroprevalence of anti-HCV antibodies in hospital-based population to be 1.76% in Uttar Pradesh in 2018. In 2010, a study conducted in Rajasthan, by Sood S et al., found the HCV prevalence of 0.28%. In 2012, Kaur R et al. observed the HCV prevalence of 1.4% in Punjab. [11-14] India accounts for a large share of the global hepatitis C burden, with 11.5% prevalence. About 15 to 18 million population live with acute or chronic hepatitis C infection in India.[15] In 2017, a study done by Desikan et al. reported the prevalence of coinfection in India to be 1.89%. Patients with co-infections are prone to develop chronic liver disease and progression to hepatocellular carcinoma and show poor response to treatment. [15-17] In our study, HBV infection, HCV infection and their co-infections were most seen in the age group of 30-40 years. Male predominance was found for hepatitis B (2:1), hepatitis C (3:1). These findings are like the study done by Grewal US et al. who reported that majority of the HBsAg positive patients (61.54%) belonged to the age group of 21-40 years and showed male predominance. A study done in Manipur, by Devi KS et al. found HBsAg positivity to be higher in the age group of 22-32 years.[18] Agarwal L et al. observed that seroprevalence of hepatitis B among males and females was 5.5% and 2.4%, respectively. Sood S et al. reported higher prevalence of HBV in males and stated that the possible reason could be that females clear the HBV infection more efficiently as compared to males. Grewal US et al., Agarwal L et al. and Sood S et al. found HCV infections more common in males as compared to females.[19] In our study the commonest risk factor associated with seropositivity of HBV was intravenous drug use, followed by blood / blood components transfusion, multiple sexual partners, needle stick injuries and hemodialysis. Hepatitis C infection was most seen with blood / blood components transfusion, followed by intravenous drug use, multiple sexual partners, and hemodialysis. In our country, median population attributable fraction for chronic hepatitis B linked to injections was estimated to be 46% while that for hepatitis C and HIV was 38% and 12%, respectively. Co-infections should be a matter of concern, emphasizing the importance of education of masses regarding various modes of transmission of HBV and HCV. An essential step is encouraging and motivating health care providers to adopt infection prevention and control practices, to combat viral hepatitis.

CONCLUSIONS:

In India, viral hepatitis contributes to a significant health related burden, resulting in ensuing outcomes such as liver cirrhosis and hepatocellular carcinoma. Therefore, screening of high-risk population becomes the most important approach for the prevention and control of HBV and HCV. The study highlights the need of awareness by counseling and health education, regarding the safe injection practices, safe sexual practices and screening of blood and blood products. Early detection of the infection and timely treatment results in better prognosis, thereby limiting the liver - related disease burden. Educating the people about vaccination against HBV, will help in the prevention of disease and increase the herd immunity.

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