Original Research Article

Epidemiology of Viral Hepatitis in a tertiary care Hospital of North India

ABSTRACT

INTRODUCTION: Viral hepatitis is used to describe protracted hepatocellular necrosis and inflammation, often with fibrosis, that lasts longer than 6 months and is caused by HBV, HCV, HBV-associated HDV or HEV. Chronic hepatitis is classified histologically by the degree of hepatocellular necrosis, inflammation, and fibrosis. Jaundice is a consistent clinical presentation of viral hepatitis. HBV and HCV together are estimated to have led to 500 million chronically infected persons and one million deaths annually. Globally, approximately 240 people have been infected worldwide with hepatitis B Virus (HBV). In view of the problem, the study had been planned to highlight the viral agents responsible for causing hepatitis in patient presenting with jaundice in a tertiary care hospital in north India, and developing strategies for surveillance of preventable viral hepatitis. AIMS AND OBJECTIVES: 1) To study the etiological profile of Hepatitis in IPD patients. 2) To estimate sero-positivity of Hepatitis causing viruses in IPD patient of hepatitis, presenting with jaundice using ELISA. MATERIAL AND METHODS: The study was conducted in a tertiary care hospital of north India over a period of one year from 1st July 2016 to 30th June 2017. It was a cross sectional prospective study. All analysis procedures were performed using commercial kits based on the enzyme-linked immunosorbent assay (ELISA) as per the manufacturer's instructions. RESULTS: A total of 573 serum samples from patients with clinical suspicion of jaundice were tested, out of which 236 (41.2%) patient's serum were tested positive for viral hepatitis in which HBsAg was detected in 52 cases, Hepatitis C was not detected in any case, Hepatitis D was detected in 3 cases, Hepatitis E was detected in 108 cases and remaining were other acute viral hepatitis cases. Out of 236 cases positive for viral hepatitis, 47 were children and 189 were adults, females (155 cases) outnumbered males (81 cases). HBsAg was associated with other diseases in 21 cases. The maximum number of cases in which HBsAg was detected belonged to 21-30 years of age. Hepatitis B was associated with HIV infection in 13 cases. Hepatitis D and B virus coinfection was found in 3 cases. Hepatitis E was detected in 108 cases among which only 3 cases had co-infection with Hepatitis B. CONCLUSION:The viruses responsible for hepatitis can increase the mortality as well as morbidity when they are associated with other diseases. The prevalence of Hepatitis B was more common in younger population. The increasing frequency of i.v. drug abuse can be a contributory factor for this, which necessitates the counselling & vaccination of young population regarding the same. HEV, which has a feco-oral route of transmission, was found in many cases, which can be prevented by improving the hygiene and creating awareness.

Keywords: Viral hepatitis, co-infection, HBsAg, ELISA, Jaundice

INTRODUCTION

Viral hepatitis is used to describe protracted hepatocellular necrosis and inflammation, often with fibrosis, that lasts longer than 6 months and is caused by HBV, HCV, HBV-associated HDV or HEV. Chronic hepatitis is classified histologically by the degree of hepatocellular necrosis, inflammation, and fibrosis. Jaundice is a consistent clinical presentation of viral hepatitis. Jaundice or icterus is a yellowish discoloration of tissue resulting from the deposition of bilirubin. Tissue deposition of bilirubin occurs only in the presence of serum hyperbilirubinemia and is a sign of either liver disease or less often a hemolytic disease. Presence of scleral icterus indicates a serum bilirubin of at least 51μmol/L (3.0 mg/dL)

HBV and HCV together are estimated to have led to 500 million chronically infected persons and one million deaths annually. Globally, approximately 240 people have been infected worldwide with hepatitis B Virus (HBV). India has approximately HBV 3.0% carrier rate for HBV with a high prevalence rate in the tribal population. India has more than 37 million HBV carriers and contributes a large proportion of HBV burden.[1] Among the vaccine preventable disease hepatitis A accounts for more than 100,000 deaths globally.[2]

Acute liver failure (ALF) with coagulopathy, encephalopathy and cerebral edema occurs more commonly with HBV than the other hepatotropic viruses. Both chronic hepatitis B and C are associated with an increased risk of hepatocellular carcinoma (HCC). HBV infects more than 350 million people worldwide and is the leading cause of chronic hepatitis, cirrhosis, and HCC. The sequelae of chronic infection account for more than 1 million deaths annually. Risk factors for the development of HCC are male sex, older age, alcohol intake, other environmental exposures (i.e., aflatoxin), the presence of HBeAg, and higher levels of HBV DNA. Successful vaccination prevents HBV infection and therefore reduces chances of HCC.[3] In a study, the elevated alpha-fetoprotein levels were the predictor of the development of hepatocellular carcinoma. Rapidly increasing levels of alpha-fetoprotein appeared especially to be associated with rapidly growing tumors.[4]

Initially, hepatitis C was recognized in recipients of transfused blood and blood products, but the frequency among transfused persons declined from 30% in the 1960s to 4% in the early 1990s with the adoption of HCV- specific screening tests of the donor blood.[5]

In view of the problem, the study had been planned to highlight the viral agents responsible for causing hepatitis in patient presenting with jaundice in a tertiary care hospital in north India, and developing strategies for surveillance of preventable viral hepatitis.

AIMS AND OBJECTIVES

1) To study the etiological profile of Hepatitis in IPD patients.

2) To estimate sero-positivity of Hepatitis causing viruses in IPD patient of hepatitis, presenting with jaundice using ELISA.

MATERIAL AND METHODS

The study was conducted in a tertiary care hospital of north India over a period of one year from 1st July 2016 to 30th June 2017.

Study Design: It was a cross sectional prospective study.

Study Participants:

Inclusion criteria: Patients admitted to the Department of Medicine and Pediatrics with viral hepatitis presenting with jaundice were included in the study.

Exclusion criteria: Known alcoholic, patients on hepatotoxic drugs (e.g acetaminophen) and patient scrub typhus positive for IgM ELISA were excluded from the study.

Consent: Investigator and supervisor were aware of the ethics in biomedical research policy of the hospital. Keeping in view written informed consent of all participants was obtained. The information collected will be kept strictly confidential and individual identity will not be disclosed under any circumstances. The study involves no risk to the patient and involves no financial burden. The result of the study will only be used for academic purposes, framing recommendations for the improvement in services and for no other purpose.

Sample Collection: Approximately 5 ml blood sample was collected aseptically from all cases. The venipuncture site was cleaned with soap and water, rinsed with sterile water and 1-2% tincture iodine or povidone-iodine was applied and allowed to dry for 1-2 min (povidone-iodine) or 30 seconds (tincture of iodine). The tincture of iodine was removed with 70% alcohol. The blood was collected in sterile serum tubes. The tubes were then transported to the laboratory and kept on the rack and allowed to clot. The serum was separated.

All analysis procedures were performed using commercial kits based on the enzyme-linked immunosorbent assay (ELISA) as per the manufacturer's instructions.

Storage: Kits were stored according to the manufacture instructions.

PROCEDURE

The standard procedure was followed.

STATISTICAL ANALYSIS: Data collected was entered into a pre-structured data entry form, on Microsoft Excel sheet and analyzed.

RESULTS

A total of 573 serum samples from patients with clinical suspicion of jaundice were tested, out of which 236 (41.2%) patient's serum were tested positive for viral hepatitis in which HBsAg was detected in 52 cases, Hepatitis C was not detected in any case, Hepatitis D was detected in 3 cases, Hepatitis E was detected in 108 cases and remaining were other acute viral hepatitis cases.

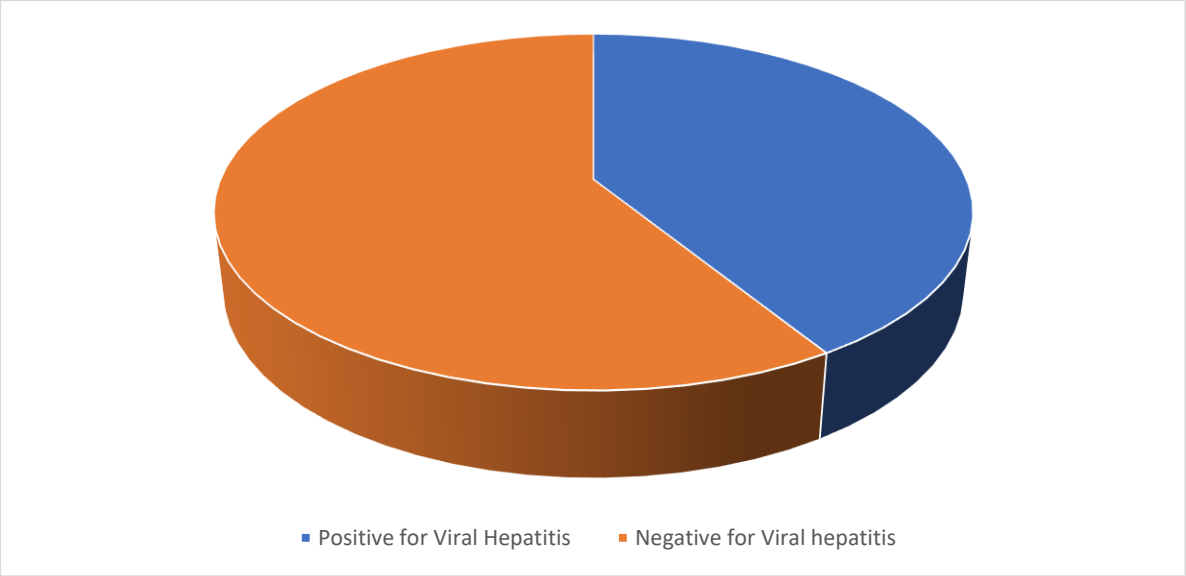

Figure 1. Percentage of Cases

Out of 236 cases positive for viral hepatitis, 47 were children and 189 were adults.

In total positive cases, females (155 cases) outnumbered males (81 cases) (Figure II).

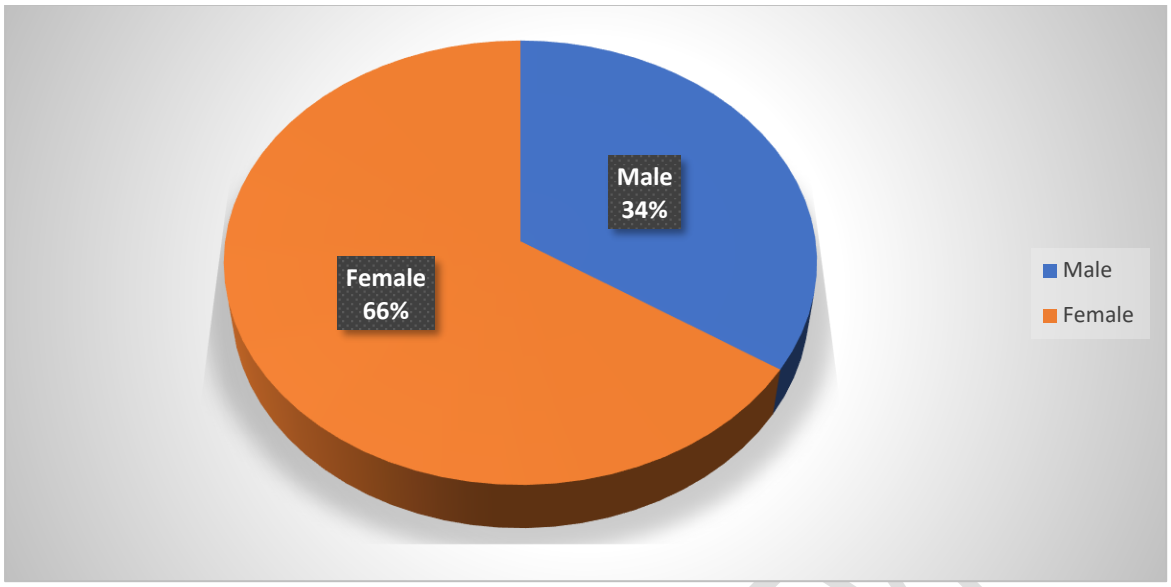

Figure II. Distribution on the basis of sex (n=236)

HBsAg was detected in 52 cases, among which 14 were males and 38 were females (Figure III).

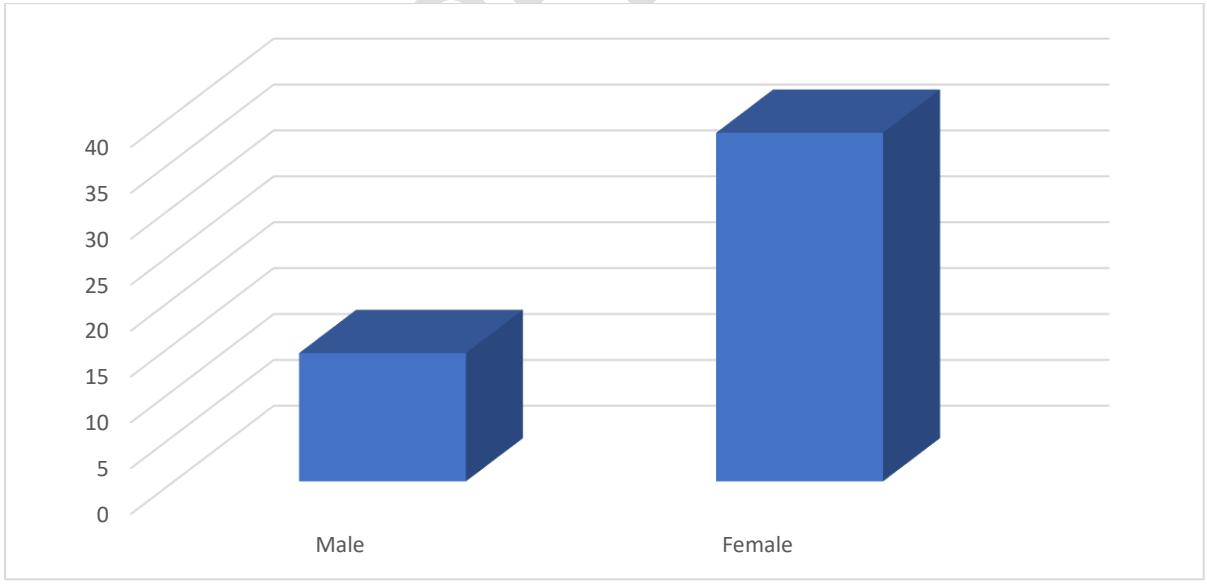

Figure III. HBsAg Positive (n=52)

HBsAg was associated with other diseases in 21 cases.

Disease associated	Number of Cases
Ca Gall Bladder	1
Chronic liver diseases	14
Tuberculosis (Respiratory)	4
Chronic kidney diseases	2

Table I: Association of HBsAg with other diseases

The maximum number of cases in which HBsAg was detected belonged to 21-30 years of age.

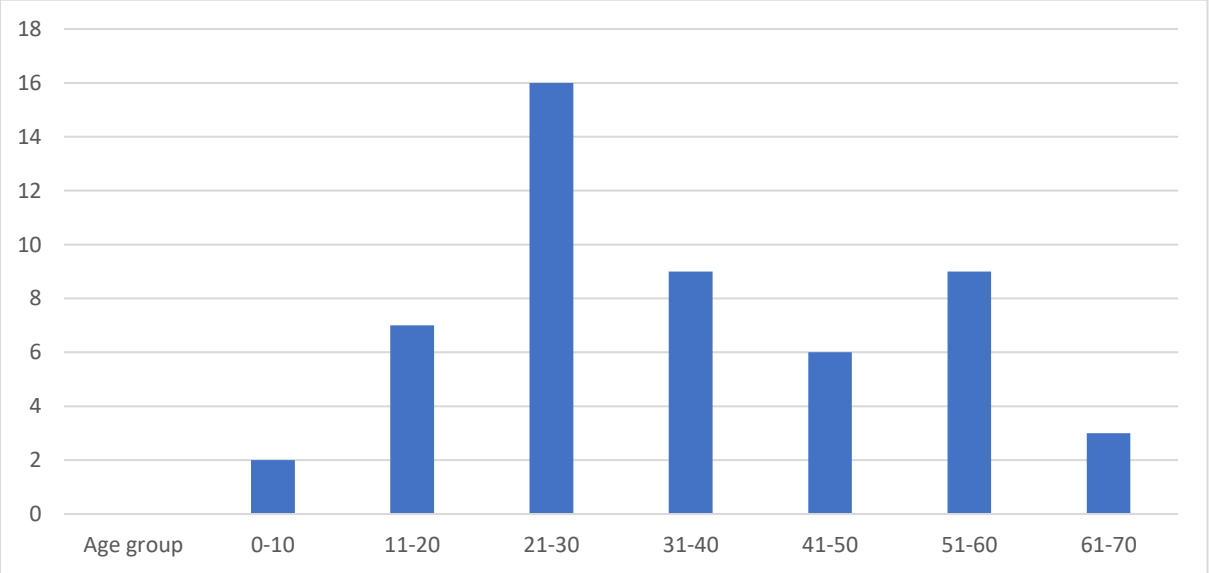

Figure IV. Distribution of HBsAg according to age group (n=236)

Out of 52 cases in which HBsAg was detected, only 4 cases gave history of blood transfusion.

Hepatitis B was associated with HIV infection in 13 cases.

Hepatitis D and B virus coinfection was found in 3 cases.

Hepatitis E was detected in 108 cases among which only 3 cases had co-infection with Hepatitis B.

Table 2. Distribution of hepatitis co-infections

Co-infection	Number of Cases (n=52)
Hepatitis B and HIV	13
Hepatitis B and Hepatitis D	3
Hepatitis B and Hepatitis E	3

In this study, 22 cases were found with co-infection of Hepatitis A and Hepatitis E.

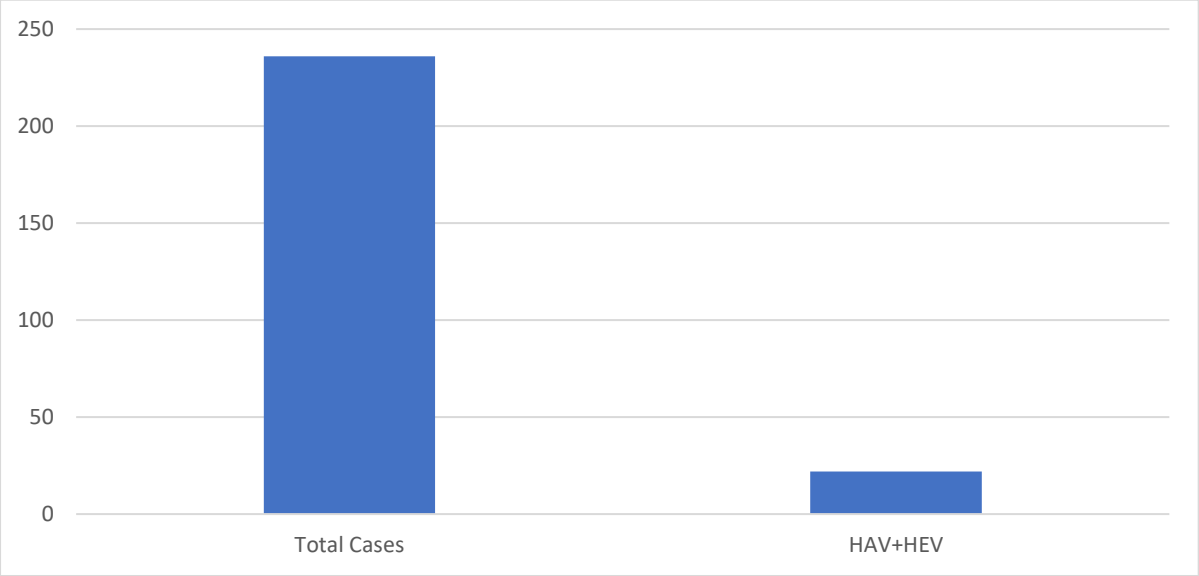

Figure V. Cases with Hepatitis A and Hepatitis E co-infection (n=236)

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DISCUSSION:

In our study, co-infection of Hepatitis B and Hepatitis E was reported in 3 (1.27%) cases. In a similar study conducted by Mohanavalli[6] et al, the co-infection of Hepatitis B and Hepatitis E was detected in 9.4% of adult patients with acute hepatitis. Similar study conducted by Chandra[7] et al observed the HBV and HEV co-infection in 3.2 % patients.

In our study, the prevalence of HBsAg was found to be 22.03%. In a similar study conducted by Ochwoto[8] et al, the prevalence of HBsAg positive cases was 50.6%. Karimi[9] reported 31.9% of seroprevalence for HBsAg. Leon[10] et al reported 52% prevalence for HBsAg. Chandra[11] et al reported 5.16% cases of Hepatitis B among clinically diagnosed cases of hepatitis. A study conducted by Bhatta[12] et al in a hospital-based population at Kathmandu Medical College Hospital, Nepal, found 2.5% prevalence of Hepatitis B. Chaudhary[13] et al reported a HBsAg prevalence of 2.28% among patients attending a surgical OPD in Rawalpindi, Pakistan.

In our study, 14 (26.9%) cases of HBsAg seropositivity were associated with chronic liver diseases. In a study conducted by Sharma[14] et al, 11% cases of HBV infection were associated with cirrhosis. In a study done by Sarine[15], chronic liver disease was associated with more than 50% of cases.

In this study, the seroprevalence of HBV in children (age group 00-20 years) was found in 9 (17.3%) cases. In similar studies, Tandon[16] et al reported 9%, Icchpujani[17] reported 10.2% HBsAg prevalence rates in children among acute viral hepatitis cases.

In this study, the prevalence of HBsAg was 73.1% in females and 26.9% in males. The highest prevalence of HBsAg was observed in age range of 21-30 years (30.8%). The lowest prevalence was found in children from 0-10 years of age (3.84%). In a similar study done by Bhattacharya H[18] et al, the maximum number of Hepatitis B patients was found in the age group of 16-49 years. A similar study conducted by Kinfe H[19] found that the maximum number of cases (46.7%) were in 25-34 years age. In a study conducted by Mabunda N et al[20] , the maximum number of cases were in 30-39 years age group.

In this study, the number of cases with co-infection of HIV and HBV were 13 (25%). A similar study conducted by Remera[21] et al found only 0.5% cases with HIV and HBV co-infections. According to a similar study conducted by Shrestha[22] LB et al, HIV-HBV co-infection were seen in 2.95% cases. A study conducted by Pradhan R[23] et al found that 4.20% cases were co-infected with HIV and HBV.

In this study, the prevalence of HDV-HBV co-infection was 5.76%. A similar study conducted by Caredda[24]et al. 1983, had a prevalence of 5%.

CONCLUSION:

Our study determined the various epidemiological factors associated with viral hepatitis. The viruses responsible for hepatitis can increase the mortality as well as morbidity when they are associated with other diseases. The study showed that the prevalence of Hepatitis B was more common in younger population in our area. The increasing frequency of i.v. drug abuse can be a contributory factor for this, which necessitates the counselling & vaccination of young population regarding the same. HEV, which has a feco-oral route of transmission, was found in many cases, which can be prevented by improving the hygiene and creating awareness.

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