

STUDY OF CLINICAL PROFILE OF PATIENTS WITH HEPATITIS B COINFECTION IN HUMAN IMMUNODEFICIENCY VIRUS INFECTED PATIENTS

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Received : 03/07/2022
Received in revised form : 25/08/2022
Accepted : 01/09/2022

Keywords:
Hepatitis B,
HIV

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DOI: 10.47009/jamp.2022.4.4.53

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2022; 4 (4); 275-278



Abstract

Background: Infection with the hepatitis B virus (HBV) is the leading cause of liver cirrhosis, chronic hepatitis, and hepatocellular carcinoma worldwide. The co-infection of HBV with the human immunodeficiency virus (HIV) is rather common due to the similar transmission mechanisms. Estimates suggest that 10% of HIV-positive people worldwide also have HBV. HBV seroprevalence has decreased dramatically in areas where an HBV vaccination programme is in place. When patients who are HIV/HBV co-infected begin combination antiretroviral therapy (cART), HBV coinfection accelerates the immunologic and clinical progression of HIV infection and increases the risk of hepatotoxicity, whereas HIV infection increases the risk of hepatitis events, cirrhosis, and end-stage liver disease linked to chronic HBV infection. The aim is to investigate the clinical features of persons with hepatitis B who are also infected with the human immunodeficiency virus. **Materials and Methods:** A clinical observational study was carried out on ART clinic patients. Between December 2012 and May 2014, all HIV-HBV co-infected patients who visited the ART clinic and those who were admitted to the infectious diseases unit of the department of medicine at Calicut Medical College were included in the study. **Result:** Total bilirubin of the 25 patients ranged from 0.3mg/dl-7.7mg/dl with a mean of 1.12mg/dl. 22 patients had total bilirubin value <1.3mg/dl and 3 patients had total bilirubin value >1.3mg/dl. Normal Range (0.3-1.3mg/dl)138. Direct bilirubin ranged from 0.1mg/dl to 3.8mg/dl with a mean of 0.58mg/dl. 17 patients had a value of less than 0.4 and 8 had values of 0.4 and above 0.4. **Conclusion:** The majority of patients had numerous channels of transmission, with 72% of all cases involving multiple heterosexual interactions. Safe sexual behaviour, avoiding sharing of needles and diluent, being vaccinated against HBV, and utilising cART with tenofovir disoproxil fumarate with emtricitabine or lamivudine are the most effective approaches for minimising the illness burden of HBV infection in HIV-infected people. Vaccination may be beneficial to HIV patients.

INTRODUCTION

Human Immunodeficiency Virus (HIV) infection is a major public health problem across the globe, particularly in developing and populous countries. Hepatitis B, which has a high prevalence and the same mode of transmission as HIV, is also a concern to India. As Hepatitis B Virus (HBV) co-infections emerge in HIV-positive persons, the situation becomes more complicated since those who are at high risk for HIV infection may also be at high risk for other pathogens such as HBV.^[1] Such HIV and HBV co-infection has been linked to decreased survival as well as an increased risk of

hepatotoxicity and development to serious liver disease.^[2]

Liver illness is thought to be directly or indirectly responsible for one-third of HIV patients' deaths.^[2] Therefore, it is crucial to comprehend the scope of such co-infections and the dynamics of their transmission, which might differ culturally and regionally, in order to develop preventative and intervention methods. The goal of the current research was to determine the extent of HBV and HIV co-infection at Kozhikode Medical College.

Aims of Study

To investigate the clinical features of persons infected with the human immunodeficiency virus who also have hepatitis B.

Its objectives

1. To study on the transmission channels of hepatitis B in HIV-positive individuals,
2. To study the level of liver damage as determined by blood tests and imaging techniques, and
3. Research on the link between CD4 and hepatitis B coinfection in individuals infected with the human immunodeficiency virus is underway.

MATERIALS AND METHODS

Ethical institutional permission was taken.

Study Design: Patients who visit the ART clinic at Kozhikode Medical College participated in this clinical observational research.

Study Population: All HIV-HBV co-infected patients admitted to the infectious diseases unit of the department of medicine at Calicut Medical College between December 2012 and May 2014 and receiving ART were included in the study. Patients under the age of 18 who did not offer informed consent were not included in the study.

Study Duration: The research was carried out between December 2012 and May 2014.

Course of study: The patients recruited for the study had extensive clinical examinations, including a history review, physical examination, and laboratory testing. The laboratory investigations comprised standard procedures such as a complete blood count, random blood sugar, renal function tests, liver function tests, HIV-1 and HIV-2 antibodies by ELISA, Hbs Ag by ELISA, Anti HCV, Anti HBV DNA by PCR, CD4 count, and abdominal ultrasound. As part of the study's protocol, each patient was thoroughly evaluated with a history, examination, and investigations.

Statistical analysis: SPS software was used for the routine statistical analysis of the data.

RESULTS

Age Distribution: Patients in this study range in age from 30 to 60 years, with a mean of 42.2 years. They were divided up into five groups. Groups 1:18–30 years old and 2:31–40 years old. Groups 3 and 4 are made up of people aged 41 to 60. The 30-year-old guy was the youngest, while the 60 year old male was the oldest. The majority were in Group 3 between the ages of 41 and 50.

Gender Distribution: Out of the 25 patients majority were males (20/25) and (5/25) were females.

Geographical Distribution: The majority of patients were from the districts of Kannur and Malappuram. Three patients were located outside of Kerala.

Routes of Transmission: Multiple heterosexual partners were discovered to be the most common method of transmission among patients with coinfection in 18 patients, 16 of whom also had a high risk of homosexuality, 4 of whom had undergone surgery in the past, 2 of whom had received blood transfusions, and 2 of whom had abused intravenous drugs in the past. The vast majority of cases have several transmission paths.

Symptoms: The majority of the patients were asymptomatic; 5 of the 25 had fatigability as a symptom, 3 had yellowish discoloration, 2 had pedal edoema, and only one had hematemesis, melena, and an abnormal sleep pattern. The majority of the symptomatic individuals had more than one symptom.

Signs: Seven of the twenty-five patients exhibited hepatomegaly, three had splenomegaly, four had pallor, seven had clubbing, three had pedal edoema, and only one had hepatic encephalopathy and flap. The majority of the patients had more than one clinical symptom.

Total Bilirubin: Total bilirubin of the 25 patients ranged from 0.3mg/dl-7.7mg/dl with a mean of 1.12mg/dl. 22 patients had total bilirubin value <1.3mg/dl and 3 patients had total bilirubin value >1.3mg/dl. Normal Range (0.3-1.3mg/dl)138. Direct bilirubin ranged from 0.1mg/dl to 3.8mg/dl with a mean of 0.58mg/dl. There were 17 patients with values less than 0.4 and 8 with values between 0.4 and 0.4.

Total Protein: The total protein of the 25 patients ranged from 5.3 to 9g/dl with a mean of 7.268. Normal range 6.7-8.6g/dl

Albumin: Albumin ranged from 2 mg/dl to 5.15 mg/dl with a mean 3.72. Despite the coinfection, the majority of patients had S. albumin levels more than 4.

- 11 individuals had serum albumin levels of less than 4mg/dl.
- 14 patients had serum albumin of more than 4mg/dl.

Aspartate Aminotransferase (AST, SGOT): SGOT varies from 16U/L-171U/L.normal range - 12-38U/L.of the 25 patients, 8 had levels of 38 and 17 had values more than 38.

Alanine Aminotransferase (ALT, SGPT): The 25 patients' SGPT readings varied from 15 to 125 U/L, with a mean of 48.32.

Alkaline Phosphatase: Ranged from 37U/L to 329U/L with a mean of 100.28U/L.

- Patient with highest ALP of 329 had disseminated Tuberculosis.
- All 25 patients had an abdominal ultrasound.

- 12 had raised liver echo texture and 13 had normal echo texture.

HBV DNA: Of the 25 patients HBV DNA by PCR could be done only in 18 patients due to monetary constraints

- 8 of the 25 patients had no detectable copies
- 8 patients had >20,000IU/ml
- 2 patients had less than <20,000IU/ml

CD4 Count Before ART

The CD4 count of the 25 patients with coinfection before starting ART was done

- 17 individuals had CD4 counts below 200;
- 6 patients had counts between 200 and 350; and
- 2 patients had counts over 350.

The majority of coinfecting individuals had CD4 levels of 200 or above, which was a notable result in our study.

Patients with lower CD4 levels had more HBV DNA copies.

- HBV DNA levels exceeded 20,000 IU/ml in 5 of the 17 individuals with CD4 counts \leq 200.
- Two of the six patients with CD4 counts ranging from 200 to 350 had HBV DNA levels more than 20,000 IU/ml.
- Two people had CD4 counts higher than 350, and one had HBV DNA levels higher than 20,000 IU/ml.

Complications of the 25 patients:

- One patient due to gastrointestinal bleed
- One due to disseminated tuberculosis.
- One committed suicide

DISCUSSION

According to estimates, India has the third-highest number of HIV-positive individuals worldwide. According to the HIV Estimations 2012, there are 20.89 lakh estimated HIV/AIDS patients in India. HIV and the hepatitis B virus both spread via comparable pathways. People living with HIV have a faster development of viral hepatitis and more liver-related health problems. Despite the fact that HAART has extended the lives of HIV-positive people, liver disease—often caused by the Hepatitis B or C viruses—has surpassed AIDS as the leading cause of non-AIDS-related death. Because there isn't much study on hepatitis coinfection in HIV Patients in India, we opted to analyse patients who were coinfecting with HIV and hepatitis B and visited the ART Clinic.^[3]

A total of 25 individuals with HIV and HBV coinfection were identified and studied over the research period.

20/25 (80%) of the participants in our research were men, while 5/25 (20%) were women. This is because men are more likely than women to coinfect with HIV and HBV. This study by Gupta and

Singh among Indian patients with HIV and HBV, in which males outnumbered women, is similar.^[4]

Most of them were asymptomatic (20/25), followed by fatigability probably due to associated iron deficiency anemia and nutritional deficiencies or zidovudine induced anemia. In our study the haemoglobin values ranged from 5g% to 15g%. Only one patient developed hematemesis, malaena and anaemia due to blood loss. Thus, patients should get dietary guidance for a healthy, balanced diet. A total of 25 individuals with HIV and HBV coinfection were identified and studied over the research period.

Most of them were asymptomatic (20/25), followed by fatigability probably due to associated iron deficiency anemia and nutritional deficiencies or zidovudine induced anemia. In our study the haemoglobin values ranged from 5g% to 15g%. Only one patient developed hematemesis, malaena and anaemia due to blood loss. Hence the patients should be advised on proper balanced diet.

According to a research from Nigeria and a few other studies⁵, 17 out of 25 patients had an initial CD4 level below 200, 6 out of 25 patients had a CD4 level between 200 and 350, and 2 patients had a CD4 level beyond 350.^[5,6,7]

According to reports, co-infection of hepatotropic viruses with HIV illness significantly impairs cell-mediated responses and speeds up hepatotropic viral multiplication.^[8,9,10]

Additionally, HIV co-infection makes it far more difficult to diagnose and treat. HBV infection in AIDS patients is reportedly less likely to clear following exposure, more likely to reactivate after latent infection, or both.^[11]

EFFECT OF HBV ON HIV: In contrast to how HIV affects HBV, how HBV affects HIV is less apparent. However, a research by Miller,^[12] shows that co-infection with HBV or HCV has been linked to greater hepatotoxicity to highly active antiretroviral treatment (HAART).

Sulkowski M S, Thomas et al,^[13] on Hepatotoxicity associated with antiretroviral therapy in adults with human immunodeficiency virus infection, as well as the role of hepatitis C or B virus infection, where hepatotoxicity was associated with nevirapine or efavirenz-containing antiretroviral therapy, was consistent with our study, in which a patient with HIV/HBV experienced a stage of acute hepatic failure following a drug reaction to nevirapine.

14 of the 25 patients had ALT levels larger than 41, and 5 had levels greater than two times higher. The average ALT level was 48.32. According to the Mumbai research, the mean ALT in the HIV-HBV coinfecting group was high in 9.5% of the patients.

The recent NACO guidelines MAY 2013

CHOICE OF ART- For HIV-infected patients with HBsAg positivity, first-line ART should include an ARV with anti HBV activity, such as 3TC (or FTC) and TDF (and HBeag positive if known)

Preferred line of ART - TDF+TC+EFV (Tenofovir plus Lamivudine plus Efavirenz)

In India, the prevalence of HIV/HBV coinfection ranges between 2-7%, and there has been little study on Hepatitis B coinfection in HIV patients.

Our research showed the modes of transmission, degree of liver injury, and low CD4 levels that were linked to increased HBV DNA levels.

Limitations of this Study

- Few investigations could not be done like Hbeag/anti HBe, anti HBc due to monetary constraints.
- We could not do liver biopsy for these patients which would characterize the grade of liver damage
- This is a descriptive research. Because no controls were compared, statistical power for numerous diagnostic variables could not be calculated.

CONCLUSION

- During my study period, 25 individuals with hepatitis B and human immunodeficiency virus infections visited an ART clinic.
- Males outnumbered girls by a margin of 80% to 20%.
- The majority of the patients were from the Kerala districts of Kannur and Malapurram.
- The majority of patients had more than one mode of transmission, with numerous heterosexual relationships being the most prevalent (72%).
- 80% of the patients were asymptomatic, with fatiguability being the most prevalent symptom among the symptomatic patients.
- Despite the coinfection, the majority of the patients had S. albumin levels greater than 4.
- Of the 25 patients 56% had Alanine aminotransferase>41 signifying liver dysfunction
- 48% patients showed raised liver echotexture on Ultrasound Abdomen
- 68% of the coinfecting HIV/HBV patients before ART had a CD4 count less than 200
- Patients with lower CD4 count had higher HBV DNA levels.

- There were three fatalities, with just one fatality owing to gastrointestinal haemorrhage.
- HIV patients may benefit from vaccination.

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