

Concurrent infections of hepatitis C and HIV in hepatitis B patients in the north-east of Iran

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SUMMARY Co-infection of HBV, HCV and HIV is common because of shared routes of viral transmission with increased risk of morbidity and mortality. Anti-HCV and HIV antibodies of 168 HBV patients were assayed. Co-infection of HCV in HBV patients was seen in four cases (2.4%). Simultaneous infection of HIV in HBV patients was seen in three cases (1.8%). There was no simultaneous co-infection of HCV, HIV and HBV. It is recommended that all patients are screened for possible co-infections before initiating treatment.

Introduction

Hepatitis B virus (HBV) is a DNA virus of the Hepadnaviridae family. It infects 350 million people worldwide and serological evidence of past or present infection by HBV has been shown in approximately one-third of the population. It causes liver diseases ranging from acute hepatitis to chronic hepatitis, cirrhosis and hepatocellular carcinoma (HCC), with nearly one million deaths annually.^{1–2}

The epidemiology of HBV resembles that of HIV in transmission, which generally involves blood transfusion, needles and intimate personal contact.¹ The probability of HBV transmission is 100 times greater than for HIV.³ It is suggested that HIV patients should routinely be tested for HBV and HCV infection before initiating HIV treatment.⁴

Currently, in our country, there are about two million people with hepatitis B and 200,000 of these are suffering from chronic hepatitis.^{5–7} Concurrent infections of HIV,

HCV and HBV are considered to be a major health problem which, over time, have had a very important effect on world health because their modes of transmission are similar. Many people with HIV are infected with HBV or HCV and, in some cases, with all three simultaneously, which increases the risk of fulminant hepatitis, cirrhosis and liver cancer.^{8–9}

Therefore, the co-infection of hepatitis B infection with HCV and HIV is an important factor, which has not yet been determined in the Golestan Province. In this study, HCV and HIV infections were evaluated in people with chronic HBV.

Methods

This descriptive study was conducted in 2009 on 168 patients with hepatitis B in Gorgan, north-east Iran. Our samples were selected randomly from patients who were referred by specialists to the virology diagnostic laboratory of the Golestan University of Medical Sciences for determination of HBV viral load: all of them had shown more than 10,000 viral particles per millilitre. The particle count was done with realtime polymerase chain reaction in the ABI 5700 system. Samples were kept at -80°C . HCV and HIV antibody detection was performed using the ELISA method. HIV and HCV antibody kits were made by DIA.PRO (Milan, Italy). The specificity and sensitivity of the HCV antibody kit were 100% and 97.5%, respectively. Specificity and sensitivity for the HIV antibody kits were 99.8% and 100%, respectively. Data entry was done using SPSS software version 16 and statistical analysis by Chi-square and *t*-test were applied. The *P* value of ≤ 0.05 was significant. This trial was accepted by the ethics committee of the Golestan University of Medical Sciences.

Results

The mean age of the patients studied was 37.12 ± 12.07 years and most of were male (76.3%).

HCV co-infection rate

Four cases (2.4%) showed infection with HCV. None of the patients had co-infection of HCV and HIV in HBV-infected cases at the same time. All those infected with HCV were male. The frequency of HCV infection in patients with HBV with regard to their sex is shown in Table 1. All four co-infected patients were aged between 21–40 years. Two of them were aged between 21–30 years and two were 31–40 years.

HIV co-infection rate

Three (1.8%) of the patients infected with HBV were simultaneously infected with HIV: two (1.6% of the men) men and one (2.6% of the women) woman. Among the positive cases, one was under 20 years old, one patient was in the 41–50

Table 1 The frequency of hepatitis C virus (HCV) infection in patients with hepatitis B virus (HBV) according to their sex

Variables	HCV		Total	
	Positive	Negative		
Sex	Male	4 (3.1%)	125 (96.9%)	129 (76.8%)
	Female	0	39 (100%)	
Total		4 (2.4%)	164 (97.6%)	168 (100%)

years age group and another was in the 51–60 years age group. The frequency of HIV co-infection in patients with HBV with regard to their sex is shown in Table 2.

Concurrent HIV and HCV infection rate

There was no concurrent HCV and HIV infection in HBV-infected patients.

Discussion

The different rate of HCV, HBV and HIV co-infection depends on the regional surveillance and the identification of risk factors involved in chronicity and treatment. Results obtained in this study showed that in the co-infection of seven cases (4.2%), four (2.4%) had HCV and three (1.8%) had HIV.

The findings of the co-infections of HCV and HBV in our report are different from those reported in a former study from our region which showed 12.3% co-infection.¹⁰ This variation could be due to a different number of tested people (168 versus 1850) and as a result of the chronic infected patients and genomic detection of infection in our study. Our findings are similar to another study in Tehran, among 3714 patients with positive HBs antigen. However, there was one patient with co-infection of all three viruses.¹¹ There was also a similarity with a research paper from India among 100 renal failure patients with 3% having co-infection of HBV and HCV.¹² In a report from Italy on 1047 prisoners, 4% of had both HIV and HCV infection but also showed 18% positivity for HCV/HBV co-infection.¹³

In contrast, some studies which showed concurrent infection in intravenous drug users of 20.2% were higher than seen in ours.¹⁴ Co-infection of HBV and HCV in renal failure is about 37.1% in India.¹⁵

There was no significant statistical relation between HBV infection and HIV or HCV infection in our study and it does not seem to be comparable. Therefore, there is a need for further investigation involving larger samples.

Table 2 The frequency of HIV infection in patients with hepatitis B virus according to their sex

Variables	HIV		Total	
	Positive	Negative		
Sex	Male	2 (1.6%)	127 (98.4%)	129 (76.8%)
	Female	1 (2.6%)	38 (97.4%)	
Total		3 (1.8%)	165 (98.2%)	168 (100%)

All HCV co-infected patients were men aged between 21 to 40 years, perhaps due to their social and cultural behaviour.^{16–18} An influence of HCV on HBV infection promoting occult hepatitis B (OHBV) infection has been suggested.^{16,19} However, an association between the absence of chronic HCV and occult HBV infection has also been reported.²⁰

In contrast to the HCV results, co-infection with HIV was seen in both male and female HBV patients in different age groups. A significant correlation between HIV resistance mutations, active HBV and positive HCV status has been shown before. Furthermore, co-infection of HBV and HCV enhances the risk of hepatotoxicity caused by HIV antiretroviral treatment regimens.²¹

It has also been suggested that chronicity and rapid progression to cirrhosis of HBV in HIV co-infected patients is more frequent.^{16,22}

Conclusions

It is advisable to screen all patients for possible co-infections before initiating treatment.

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