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Original Research Article

Sero-prevalence of Hepatitis B and Hepatitis C co- infections in HIV infected patients at a tertiary care hospital of eastern Nepal

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Abstract

Introduction: Human immunodeficiency virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are common viral infections worldwide. As these viruses have similar mode of transmission, the risk of co-infection is high, resulting in rapid progression of the disease.
Objective: The objective of this study is to determine the prevalence of Hepatitis B and Hepatitis C among newly diagnosed HIV infected patients attending a tertiary care hospital of Nepal.
Methods: A total of 100 newly diagnosed HIV positive patients attending CD4 laboratory, B.P Koirala Institute of Health Sciences, Nepal who gave informed written consent to participate in the study were included. Questionnaires included basic demographic data, previous history and risks associated with mode of transmission of HIV, HBV and HCV infection.
Results: A total of 21,760 samples were collected for HIV screening test over a period of one year. HIV test were positive in 165 (0.75%) samples among which only 100 (0.45%) were newly diagnosed HIV positive patients who were enrolled in our study. The overall rate of co-infection was 22%, among which 8 were positive for HBV infection while 14 were positive for HCV infection. Only two of the samples were positive for both HBV and HCV co-infections.
Conclusion: Our study reported high prevalence of HBV and HCV co-infections among new HIV infected patients which is a serious health concern. So, routine screening for both Hepatitis B and Hepatitis C infections in HIV positive patients is recommended for proper management of these diseases.
Keywords: HIV; HBV; HCV; Co-infections.

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1. Introduction

Human immunodeficiency virus (HIV), Hepatitis B virus(HBV) and Hepatitis C virus (HCV) are the common chronic viral infections documented worldwide[1]. It is well known that HIV, HBV and HCV share similar routes of transmission which include parenteral, sexual contact and perinatal transmission as the frequent modes of acquiring these infections [2,3]. Due to the common methods of transmission, the incidence rate of co-infections of these viruses is dramatically increasing [4].

In 2015, globally 36.7 million persons were living with HIV infection, among which the prevalence of HBV co-infection was 7.4% and HCV co-infection was 6.2%[5]. According to the National Centre for AIDS and STD control (NCASC) Nepal, a total of 32,735 people were HIV infected as of December 2016 [6]. In Nepal, the prevalence of HBV and HCV infection in the general population is 0.47%and 0.64%, respectively[7] which is significantly lower than the 3.2% and 4.1% among HIV-infected individuals[8]. However, the rate of co infection in HIV patients may be different in different geographical area as this is affected by the mode of transmission and load of infection in the population [9, 10].

The introduction of combination antiretroviral therapy has increased the survival and decreased the morbidity rate in individuals infected with HIV[11,12]. Chronic hepatitis-related liver diseases have become a growing concern in HIV infected individuals [13].

Hepatitis co-infection in HIV infected individuals can have rapid progression to severe liver disease with fatal clinical outcome and can complicate clinical management of HIV[14,15]. HIV-HBV or HIV-HCV co-infection has been reported worldwide, but the data on the rate of co-infection of HCV and HBV among HIV infected individuals in Nepal is very less. Therefore, the present study was conducted to find out the sero-prevalence of HBV or HCV co infection in newly diagnosed HIV positive patients attending a tertiary care hospital in eastern Nepal.

2. Methods

This was a prospective hospital based study conducted in Department of Microbiology, B.P Koirala Institute of Health Sciences, Dharan, Nepal over 12 months period (15th October 2012 to 15th October2013). A total of 21,760 samples were collected for HIV screening test over a period of one year. The HIV tests were confirmed positive following the Nepal national guidelines. A total of 100newly diagnosed HIV positive patients who gave informed written consent to participate were included in the study. Questionnaires included basic demographic data, previous history and risks associated with mode of transmission of HIV, HBV and HCV infection. The blood was collected from each participant and tested for HBsAg using Hepacard and anti- HCV antibodies using HCV Tridot (J Mitra and Co Pvt Ltd, New Delhi, India) rapid screening kits, following the manufacturer's instruction. Each test kit is based on qualitative immune-chromatographic assay principle. The collected data was entered in Microsoft excel-2010 and converted into SPSS version 11 for statistical analysis. Chi-square test was used to evaluate the apparent differences for significances. Other several variables were studied in association to HBV and HCV infections.

3. Results

A total of 21,760 samples were collected for HIV screening test over a period of one year. The HIV tests were positive in 165 (0.75%) samples which were confirmed as per Nepal national guidelines. Among the total HIV positive cases only 100 (0.45%) were newly diagnosed HIV positive patients who were enrolled in our study. Among 100 newly diagnosed HIV positive patients, 59 were males and 41 were females between age group of 12- 55years. Around 86% of the patients belonged to the age group of 18-45 years with the mean age of 31.46 years (SD±13.43).

Out of 100 participants, 62% of the HIV infection was acquired through sexual contact while only 22% of the people acquired HIV infection through intravenous drug abuse (IVDA). The pie diagram is depicted in **Figure 1**.

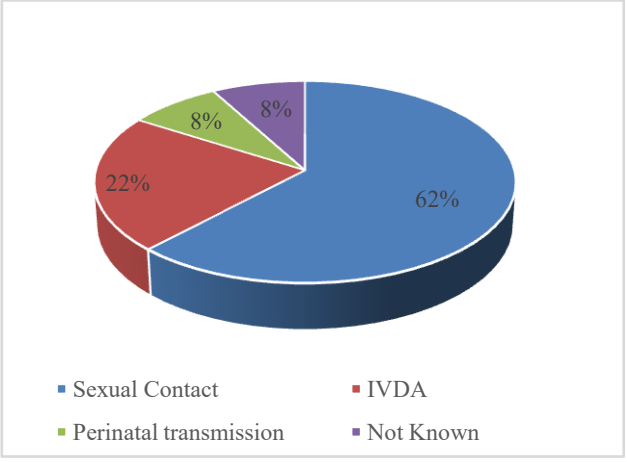

Figure 1: Primary mode of transmission of HIV

The overall rate of co-infection was 22% (22/100), among which 8 were positive for HBV infection while 14 were positive for HCV infection. Two of the specimens were positive for both HBV and HCV infections. The sex-related prevalence of co-infection showed that male had higher prevalence compared to the female with the male as high as 20%. This sex-related difference was statistically significant. The details about the rate of co-infections and sex-related prevalence have been further elicited below on **Table 1**.

Table 1: Sex-related distribution of HBV and HCV in HIV infected patients

Gender	HBV infection	HCV infection	Total	*P* value
Male	7	13	20	**<0.05**
Female	1	1	2	
Total	8	14	22	

Age-related prevalence of HBV and HCV co-infections showed a higher prevalence (13%) among age group of 31-45 years. However, zero prevalence was found among age group0-15 years of age (**Figure 2**). This age related difference was also statistically significant ($p<0.05$).

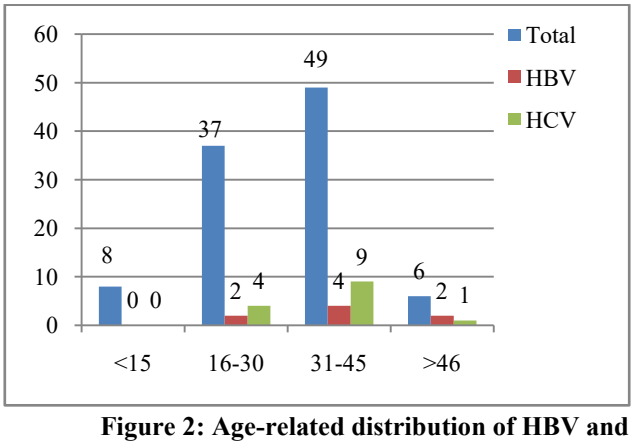

Figure 2: Age-related distribution of HBV and HCV in HIV infected Patients

Among the 8 HBV infected individuals 4 had acquired the HIV infection through sexual contact and 4 through IV drug abuse. Regarding 14 HCV infected individual 12 had acquired HIV infections through IV drug abuse and 2 via sexual contact (**Figure 3**). Two samples which were positive for both HBV and HCV infections had acquired HIV infections via IV drug abuse.

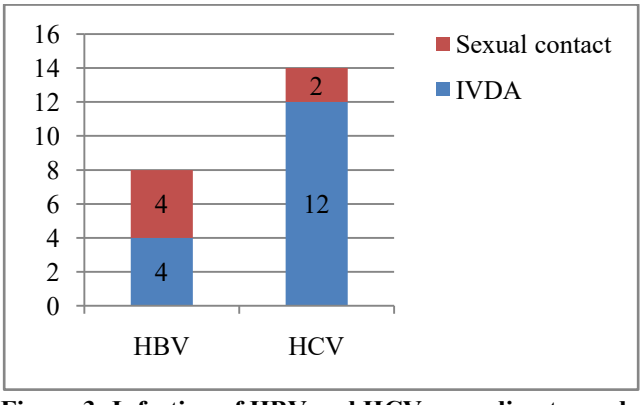

Figure 3: Infection of HBV and HCV according to mode of transmission of HIV

4. Discussion

HBV infection is one of the leading causes of morbidity and mortality among people living with HIV/AIDS[16]. Failure to diagnose and treat co-infection at an early stage results in serious complications and fatal clinical outcome.

In our study, out of 100 participants, 62% of the HIV infection was acquired through sexual contact while only 22% of the people acquired HIV infection through IV drug abuse. According to the NCASC Nepal, a total of 32,735 people were HIV infected[6]. Among them 34.1% were clients of sex workers, 10.5% were IV drug abusers, 9.3% were migrant workers, 6.3% spouses of migrant workers, 4.9% female sex workers, 1.8% men who have sex with men and blood and blood products recipients 0.4% [17]. Data on the infectious burden and clinical severity of HCV and/or HBV co-infection among these key population of HIV-infected individuals is scant and of uneven quality.

Prevalence of HIV in Nepal is approximately 0.3% and it is estimated that about one third of deaths in HIV patients are directly or indirectly related to liver diseases[1]. Among 100 participants enrolled, 22% were positive for either/both HBV or HCV infections in our study. This study showed statistically significant ($p < 0.05$) sex and age related differences in acquiring the co-infections in the participants. We reported HCV co-infection prevalence of 14%, HBV co-infection 8% and 2% with triple infection in this study. In US among 1.2 million HIV infected people, about 10% are co-infected with HIV-HBV and 25% with HIV-HCV co-infection which corresponds to our findings [18]. In US and Europe, HIV and HBV co-infection was reported to be 6% to 14% whereas reports for HIV and HCV co-infections varied from 25% to50% [19, 20]. Similar findings were reported from Africa with 15% prevalence of HIV-HCV co-infection among newly diagnosed HIV patients[3]. Global Hepatitis Report 2017, have reported a global prevalence of HBV-HIV co-infection 7.4% which is similar to our findings whereas HCV-HIV co-infection was 6.2% which is lower than our result[5]. In contrast to our findings, a study from India reported lower prevalence of HIV-HBV (6.2%) and HIV-HCV (1.56%) co-infections among HIV infected individuals [21].

The rate of HBV and HCV co-infection in HIV patients has been reported in only few studies in Nepal. A study conducted in Nepal during 2010-2011 reported that the prevalence of HBV and HCV co-infections among the HIV positive population was 4.4% and 19% respectively[22]. Another study from Central Nepal reported low prevalence of HIV-HBV, HIV-HCV, and HIV-HBV-HCV co-infections which was reported to be 3.62%, 2.93% and 0.34% respectively[23]. In a study done in Western Nepal, the overall rate of co-infection was found to be 7.3%, among which 3.2% were positive for HIV-HBV co-infection while 4.1% were HIV-HCV co-infection, no specimen was found to be positive for all three viral marker[8].

The HIV-HCV co-infections were more common than HIV- HBV co-infection in our study which may be due to higher prevalence of IVDAs in the region of Nepal where our study was conducted. Lack of available vaccines for HCV is also one of the responsible factors for higher prevalence of HCV co-infection. Triple co-infections with HIV-HBV-HCV increases the risk of acute and chronic hepatic insufficiency, cirrhosis and hepatic failure which eventually leads to higher liver related mortality. Therefore, early diagnosis of HBV and HCV infections in HIV infected individuals is essential for proper management and higher survival rate. We recommend screening tests for HBV and HCV co-infections in HIV infected patients because this study has reported high prevalence of HIV-HCV co-infection in newly diagnosed HIV patients.

5. Conclusion

Our study reported that HBV and/or HCV co-infections among HIV infected patients is a serious health concern in Nepal. The 22% sero-prevalence of HBV and/or HCV infections reported among newly diagnosed HIV patients in this study is alarmingly higher than several other studies done in the past in Nepal. We recommend improved measures for routine screening and treatment for HBV and HCV infections among HIV infected patients and their family members in Nepal to decrease overall disease prevalence and promote better health among at risk groups and the general population.

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