



## A Study of Co-Infection of HBV in HIV Patients

### KEYWORDS

HIV , HBsAG, Co-Infection, ELISA

#### \*Dr Kar H

Assistant Professor (Lecturer),  
Department of Microbiology,  
Department of Microbiology, MGM  
Medical College and Hospital,  
Sector 18, Kamothe, Navi Mumbai  
-410209. \*Corresponding Author

#### Dr Bhesania Hodiwala A

Professor, Department of  
Microbiology, Department of  
Microbiology, MGM Medical  
College and Hospital, Sector 18,  
Kamothe, Navi Mumbai -410209.

#### Mr Batazoo A

MSc. Student, Department of  
Microbiology, MGM Medical  
College and Hospital, Sector 18,  
Kamothe, Navi Mumbai -410209.

**ABSTRACT** Human immunodeficiency virus (HIV) is a Lenti virus a member of the retro virus family that causes acquired immunodeficiency syndrome, a condition in which progressive failure of the immune system allows life threatening opportunistic infection and cancers to thrive. Owing to shared transmission route hepatitis B viral infection are highly prevalent among HIV infected patients. Our study shows, out of 8247 HIV suspected cases only 2 % (170/8247) were reactive for HIV and the prevalence of Hepatitis B virus (HBV) infection was 2.4% (187/7715). In total 170 patients were reactive for HIV and 187 patients were reactive for HBV and, 16 patients were reactive for both. This shows 9.4% (16/170) of seropositive patients were co-infected. In our study the commonest risk factors for transmission was unprotected sex which was 68.7% (11/16), intravenous drug use was the second most common risk factor, which was 31.2% (5/16) and the homosexuality was the least common factor, which was 6.2% (1/170). Maximum of HIV and Hepatitis B co-infected patients were of age group of 21-40 years which was 56.25% (9/16), followed by the age group 41 to 60 (37.5%) 6/16. The least age group were from 0 to 20 that was 6.25 % (1/16) and there were no any co infected patient above 61 years. The rate of progression and complications from viral hepatitis are accelerated in patients with HIV co-infection. After acquiring hepatitis B infection HIV infected individuals are more likely to develop chronic hepatitis B infections leading to hepatocellular carcinoma than HIV negative individuals. This represents another potential co-morbidity for patients with HIV infections. Early diagnosis and treatment with ART will increase the longevity of seropositive patients irrespective of CD4+ count.

### INTRODUCTION

Human immunodeficiency virus (HIV) is a lentivirus (a member of the retrovirus family) that causes acquired immunodeficiency syndrome (AIDS), a condition in humans in which progressive failure of the immune system allows life threatening opportunistic infections and cancers to thrive. Infection with HIV occurs by the transfer of blood or blood products, semen, vaginal fluid, pre-ejaculate, or breast milk. Within these body fluids, HIV is present as both free virus particles and virus within infected immune cells. The four major routes of transmission are unsafe sex, contaminated needles, blood or blood contaminated objects and transmission from an infected mother to her baby at birth (perinatal transmission).

Owing to shared transmission routes, hepatitis B viral infections are highly prevalent among HIV infected persons, generally as a result of shared transmission routes. The worldwide epidemic of hepatitis B and HIV have led to new understanding of the complicated interactions between these viruses. Co-infection with HIV has a major impact on the natural history, diagnosis, progression and morbidity and mortality. HBV co-infections in HIV positive individuals is of utmost importance due to the underlying consequences such as the hepatological problems associated with these viruses, which have been shown to decrease the life expectancy in the HIV-infected patients. It is characterized by more rapid progression of liver disease including accelerated fibrosis, cirrhosis and hepatocellular carcinoma and higher liver-related mortality and morbidity. In addition, there are reports of complex interactions with antiretroviral therapy (ART) including hepatotoxicity, reactivation of "silent" HBV infection and

immune reconstitution syndromes (IRIS). Hence this study was taken up with the aim to detect the presence of HIV and HBV in patients attending the tertiary care hospital, to find out the prevalence of co-infection of HBV in the HIV/AIDS patient's sample and to find out the common route of infection of HIV and HBV in the patients.

### MATERIALS AND METHODS:

This study was carried out during February 2012 to February 2013 at Department of Microbiology, M.G.M. Medical College and Hospital, Navi Mumbai, India.

A total of 8247 samples from suspected cases were collected after pre-test counselling. A written consent was obtained from all the patients. The samples were tested for HIV antibodies using Comb Aids test. Those found to be reactive were further tested by AidsScan and Pareekshak as per NACO guidelines. 170 confirmed HIV reactive samples were then tested by Hepacard test as well as ELISA test for detection of Hepatitis B surface antigen.

### RESULTS:

Out of the total 8247 samples collected during the study period, 170 (2%) were found to be reactive for HIV antibodies. The incidence of HIV infection was almost three fold more in males (75.2%) as compared to females (24.7%). Maximum (51.1%) HIV positive patients were found to be in the age group of 21-40 years and the commonest route of transmission was seen to be through unprotected sex i.e. (89.4%).

The incidence of HBV infection amongst suspected cases

was 2.4%. (187/7715). This infection was seen to be two fold more common in males i.e 57.7%. like HIV infection this infection was also seen to be maximum in 21-40 years age group.

**Table 1: Total no of co- infected patient**

Total HIV Positive	Total HIV+HBsAg Positive	Percentage
170	16	9.4

**Table 2: Age distribution of co- infected patient**

Age Distribution (years)	Number of Patients	Percentage
0-20	1	6.25
21-40	9	56.25
41-60	6	37.5
Above 61	0	0

**Table 3: Risk factors in co-infected patient**

Route of Transmission	Number of HIV + HBsAg Positive patients	Percentage
Intravenous drug users	07	43.7
Homosexual	01	6.2
Mother to Child	00	0.0
Unprotected Sex	03	18.7
Blood Transfusion	02	12.5
Invasive/Surgical procedure	03	18.7

## DISCUSSION AND CONCLUSION:

In our study, total 8247 samples were taken from HIV suspected cases. Out of which 170 (2%) were reactive to HIV infection.

This is quite comparable with the study carried out by Atul Karkare et al (2004) in central India, the prevalence of HIV infection attending STD clinic was 1.6% (36/2264).<sup>[1]</sup>

In our study, the prevalence of HBV infection was 2.4% (187 out of 7715) HBV suspected cases which is lower than that showed in a study conducted by Yumiko Yanase et al (2007) in Philippines, HBV infection was detected in 4.1% (6030/144, 624) of Blood donors<sup>[2]</sup>

In our study, out of 170 sero-positive patients, the infection was three folds more in male patients as compared to the females. 75.2% (128/170) patients were males and the rest 24.7% (42/170) were females. Whereas according to the study carried out by Somnuek Sungkanuparph et al (2004) in Thailand, within the HIV infected patients 56.5% (299/529) were males and 43.5% (230/529) were females.<sup>[3]</sup>

In our study maximum of HIV positive patients as well as HBsAg positive patients were of age group 21 to 40 years.

In a study carried out by Shanmugam Saravanan et al (2007) in South India, majority of the HIV and HBV infected patients were from the 31-40 years age group (39 %) followed by the 41-50 years age group (27%). Mean age of the HIV positive patients was 35 years (95% CI  $\pm$  6.8 years), 37 years (95% CI  $\pm$  3.6 years) among the co-infected patients. HBV-HIV co-infection was high in the

31-40 years age group (58%).<sup>[4]</sup> In a study carried out by Somnuek Sungkanuparph et al (2004) in Thailand, the mean age of HIV and HBV infected patients was 36.7 years.<sup>[3]</sup>

**Thus, our findings are comparable with the above studies.**

In our study, the commonest risk factor for transmission of HIV in the patients was by unprotected sex which was 89.4% (152/170), followed by intravenous drug use, the rate of which was 9.4% (16/170). The rate of Mother to child transmission was very less, only 0.5% (1/170).

According to the study carried out by Shanmugam Saravanan et al (2007), out of 500 HIV positive patients, 359 (72%) were heterosexual, 38 (8%) were intra venous drug users (IVDs), 46 (9%) were blood transfusion recipients and 57 (11%) were unnoticed.<sup>[4]</sup> In a study carried out by Jialun Zhou et al (2007) in Taiwan, out of 2979 patients, most patients reported HIV infection through heterosexual (59%) and homosexual contact (23%); only 5% through injecting drug use.<sup>[5]</sup>

In comparison with the above studies, our study also shows the predominant cause for HIV infection to be unprotected sex, followed by IDUs and other routes.

According to our study, within HIV infected patients, the commonest opportunistic infection associated with HIV reactive patients was Oral Candidiasis i.e. 37% (48/170), 28.2% (48/170) of patients had Tuberculosis, 22.9% (39/170) of patient had Diarrhoea, and 0.5% (1/170) had STI and 11.1% (19/170) patients were not having any opportunistic infection.

In a study by Nilanjan Chakraborty et al (2011) in India, Oral candidiasis was in 88% HIV positive patients followed by 10% by Tuberculosis of pulmonary as well as extra-pulmonary causes and the rest 2% by diarrhoea of different causes.<sup>[6]</sup>

According to our study, out of 187 patients who were tested reactive for HBsAg, (Prevalence 2.4%) 57.7% (108/187) of patients were males and 42.2% (79/187) were females.

In our study, the prevalence of HBV co-infection in HIV positive patient was 9.4% (16/170).

The prevalence rate of HIV-HBV co-infection varies from 7-25% in various studies.<sup>[7-10]</sup>

In our study, maximum of HIV- HBV co-infected patients were of age group 21 to 40 years, which was 56.25 % (9/16), followed by the age group 41 to 60, which was 37.5% (6/16). The least were of age group 0 to 20 years of age, which was 6.25% (1/16) and there were no any Hepatitis B co-infected HIV patients in the age group of above 61 years. According to the study carried out by Padmapriyadarsini C et al (2006) in India, HIV-HBV co-infected patients were of age group 20 to 40 years.<sup>[11]</sup>

According to our study, the most common risk factor in HIV and Hepatitis B co-infected patients was by Intravenous Drug use (43.7%), followed by unprotected sex and invasive/surgical procedures (18.7% each), by blood transfusion 12.5% and 6.2% by Homosexuals.

In a study carried out by Padmapriyadarsini C et al (2006)

in India, out of 81, HIV-HBV positive patients, 82.7% were infected through sexual transmission, while intravenous drug abuse was responsible for transmission in 16.04%.<sup>[11]</sup> The rate of progression and complications from viral hepatitis are accelerated in patients with HIV co infection. After acquiring HBV infection, HIV infected individuals are more likely to develop chronic hepatitis B than HIV negative individuals. This represents another potential co-morbidity for the patient with HIV infection. Chronic immunodeficiency combined with co-infections and the use of hepatotoxic agents is likely to lead to poor outcomes. So, implications of HBV co-infection in HIV patients are of great importance, as increasing number of patients are diagnosed to be having HIV disease. The knowledge of co-infection in a patient of HIV is vital since these patients, as they live longer on antiretroviral treatment will also need to be managed for their co-infection with HBV. The study documents high rate of HBV co-infection in HIV seropositive patients despite using HBsAg as the only marker of HBV infection in the study group. This rate of co-infection could have been higher if other hepatitis viral markers like HBV DNA etc. were included in the study. With the rising incidence of HIV infection in the country and longer expected life span in these patients due to better health care facilities and availability of anti retroviral drugs, the HIV-HBV co infection is a major health issue for developing countries like India. The present study emphasize that a uniform protocol should be formed to screen every HIV/AIDS patient and their co partners for Hepatitis B viral markers and vice-versa for early detection and management of Hepatitis B co-infection beside HIV infection management for better prognosis and survival of these patients. Thus, this study of HIV and Hepatitis B co-infection is necessary for the early starting of the treatment, which can reduce the mortality and morbidity of the patients.

## REFERENCE

1. Atul Karkare, Anup R. Anvikar, Vikas G. Rao et al: HIV Infection and Sexually Transmitted Diseases in Central India; Proceeding of National Symposium on Tribal Health: 2004; 8:99 | 2. Yumiko Yanase,a,b Takashi Ohida,b Yoshitaka Kaneita et al: The prevalence of HIV, HBV and HCV among Filipino blood donors and overseas work visa applicants; Bulletin of the World Health Organization; 2007: 85:131-137. | 3. Somnuek Sungkanuparph MD, Asda Vibhagool, Weerawat Manosuthi et al; Prevalence of Hepatitis B Virus and Hepatitis C Virus Co-infection with Human Immunodeficiency Virus in Thai Patients: A Tertiary-care-based Study :Journal of Medical Association, Thai;2004: 87(11): 1349-54 | 4. Shanmugam Saravanan, Vijayakumar Velu, Nagalingeswaran Kumarasamy, et al: Coinfection of hepatitis B and hepatitis C virus in HIV-infected patients in south India: World J Gastroenterol;2007: 13(37): 5015-5020 | 5. Jialun Zhou, Gregory J Dore, Fujie Zhang et al: Hepatitis B and C virus coinfection in The TREAT Asia HIV Observational Database; Journal of Gastroenterology and Hepatology 22 (2007) 1510-1518 | 6. Nilanjan Chakraborty, Anirban Mukherjee, Santanu Santra et al; Current Trends of Opportunistic Infections among HIV-Seropositive Patients from Eastern India: Indian Council of Medical Research Journal on Infectious Diseases: 2008: 61: 49-53. | 7. Dhanvijay AG, Thakar YS, Chande CA. "Hepatitis B virus infection in HIV infected patients". Indian J Med Microbiol 1999; 17 (4): 167-69. | 8. Ramanamma MV, Ramani TV, Suresh B. Sonth et al. "Incidence of hepatitis B infection in Visakhapatnam." Indian J Med Microbiol 2000; 18 (4): 170-71. | 9. Saillour F, Dabis F, Dupon M, et al. "Prevalence and determinants of antibodies to hepatitis C virus and markers for hepatitis B virus infection in patients with HIV infection in Aquitaine". BMJ 1996; 313: 461-64. | 10. Helen M. Chun, Ann M. Fieberg, Katherine Huppler Hullsiek et al. Epidemiology of Hepatitis B Virus Infection in a US Cohort of HIV-Infected Individuals during the Past 20 Years. Clin Infect Dis. 2010; 50(3):426-436 | 11. Padmapriyadarsini C, Chandrabose J, Victor L et al : Hepatitis B or hepatitis C co-infection in individuals infected with human immunodeficiency virus and effect of anti-tuberculosis drugs on liver function; Journal of Postgraduate Medicine: 2006: 52:92-6. |