

## Seroprevalence of HBV among HIV Patients and Blood Donors

Author

**Dr. Vedavati B I<sup>1</sup>, Dr. Amrutha Kumari B<sup>2</sup>, Dr. Venkatesha D<sup>3</sup>**

Mysore Medical College and Research Institute, Mysore

Email: drbivedu@gmail.com

### ABSTRACT

**Introduction:** *Hepatitis B and HIV infections are serious global public health problems. Many of the countries with high HIV burden are also affected by high prevalence of hepatitis B infection, leading to frequent HIV/HBV coinfection.*

**Objectives:** *To determine the prevalence of HBV among HIV infected individuals in comparison with blood donors.*

**Methods:** *All patients attending ICTC were screened for HIV and HBsAg. During the same period blood donors were screened for HBsAg and HIV. HIV-HBV coinfection in blood donors were noted during the study period.*

**Results:** *A total of 2804 HIV seropositive cases were studied. 53 (1.89%) were positive for HBsAg. Among 21,779 blood donors, 206(0.94%) individuals were positive for HBsAg, 31(0.14%) for HIV and 3(0.013 %) had HIV - HBV coinfection.*

**Conclusion:** *HBV prevalence among HIV infected individuals is more, compared to blood donors. Screening of HIV patients for HBsAg is of importance. All high risk groups should be compulsorily vaccinated, blood samples should be effectively screened before transfusion.*

**Key words:** *Blood Donors, Coinfection, HBV, HIV, Seroprevalence*

### INTRODUCTION

Hepatitis B virus (HBV) infection with its associated sequel is a disease of major public health importance, being the 10th leading cause of death globally<sup>[1]</sup>. Worldwide over 2 billion people

have been infected with HBV and more than 350 million have chronic HBV infection <sup>[2]</sup>. HBV infection accounts for 500,000 to 1.2 million deaths each year. Approximately, 15-40% of infected patients will develop cirrhosis, liver

failure or hepatocellular carcinoma (HCC) [3]. India has been placed into the intermediate zone of prevalence of hepatitis B (2–7% prevalence rates by WHO)<sup>[2]</sup>.

In India alone, about 2.5 million people are currently infected with HIV<sup>[4]</sup>. The national average for HBsAg positivity in the healthy donor population in India is around 4.7%<sup>[5]</sup>. Chronic hepatitis B virus infection affects 7%–10% of HIV-infected patients. Around the world, 90% of HIV-infected persons have biological signs of prior HBV infection and 5%–15% suffer from chronic infection<sup>[6]</sup>.

Human immunodeficiency virus (HIV) is known to influence the natural history of infections with certain hepatitis viruses and interactions between HIV and hepatitis viruses may potentiate HIV replication<sup>[7]</sup>. The data on Hepatitis B coinfection among HIV infected patients is scarce in southern India. The present study was designed to find the rate of HBsAg seropositivity among HIV infected patients, as studies have shown that HIV/HBV coinfection is known to result in higher viral load of hepatitis virus and greater liver damage.

## OBJECTIVES

To determine the prevalence of HBV among HIV infected individuals in comparison with blood donors.

## MATERIALS AND METHODS

This study was conducted at MMC&RI Mysore, over a period of two and half years, from January 2012 to June 2014. All patients attending ICTC were screened for HIV, as per NACO guidelines and HBsAg by card test. During the same period blood donors were screened for HBsAg and HIV by ELISA. HIV-HBV coinfection in blood donors were noted during the study period. Blood donors were considered as representative of general population.

## RESULTS

A total of 2804 HIV seropositive cases were studied. 53 (1.89%) were positive for HBsAg. Among 21779 blood donors, 206(0.94%) individuals were positive for HBsAg, 31(0.14%) for HIV and 3(0.013 %) had HIV - HBV coinfection.

High Risk Population (Hiv Seropositive)		Low Risk Population (Blood Donors)			
Total	HBV Positive	Total	HBV Positive	HIV Positive	HIV And HBV Coinfection
2804	53(1.89%)	21779	206(0.94%)	31(0.14%)	3(0.013%)

## DISCUSSION

Hepatitis B virus (HBV) infection is one of the most common infectious diseases in the world with significant acute and chronic morbidity and thus, has become a global public health problem<sup>[8]</sup>. There is high degree of epidemiological similarity between the hepatitis B virus and HIV as regard to high risk groups, routes of transmission and the presence of virus in the body fluids<sup>[7]</sup>.

In our study, HBV prevalence among HIV infected individuals is 1.89% and is almost double compared to blood donors(0.94%). Among blood donors, 0.14% were positive for HIV and 0.013 % had HIV - HBV coinfection. A study from Nepal reported seropositivity for HBsAg in blood donors was 0.87% and only 0.4% were HIV positive, coprevalence of HBV/HIV was 0.033%<sup>[8]</sup>. The prevalence of HBsAg carriers, particularly among blood donors, in northern Europe, North America and Australia is 0.1% or less; in central and Eastern Europe it is up to 5%; in southern Europe, the countries bordering the Mediterranean, and parts of Central and South America the frequency is even higher; and in some parts of Africa, Asia and the Pacific region as much as 20% of the apparently healthy population may be HBsAg positive<sup>[3]</sup>. A study conducted in Kolkata showed 8.3% positivity for HBsAg among HIV infected individuals<sup>[9]</sup>. A study from Bangladesh showed a higher prevalence of HBsAg (4.24%) in HIV positive patients than the control group(0.84%) which indicates that the prevalence of HBV in HIV patients is more than the general population<sup>[7]</sup>. Tankhiwale et al. reported

34(30.4%) were positive for HBV among 110 HIV seropositive patients<sup>[7]</sup>. Regions of the high endemicity of HBV infection include South-east Asia, Africa, China, and the Arctic Rim with a high prevalence of 8-20 percent. Areas of intermediate endemicity have a prevalence of 2-7 percent and include Eastern Europe and the Middle East. Low endemic areas such as Northern Europe, USA and Australia have prevalence below 2 percent<sup>[8]</sup>.

The co-infection has pronounced effect on the natural history of these infections. Although the effect of HBV infection on HIV is uncertain, HIV appears to have marked influence on the natural history of HBV infection. HBV is not directly cytopathic to liver cells, hepatic necrosis is being mediated by Th1 lymphocytes induced cytotoxic T lymphocytes (CTL). Therefore, any process which affects quantity and quality of CTL response will have a bearing on the outcome of liver damage in HBV infections. Further, in HIV-HBV co-infection, there is an increase in persistence of HBV, increase in HBV viral load and increase in the incidence of HBV reactivation and re-infection. However, despite an increase in HBV-DNA load, hepatic necrosis is less as the activity and number of CTL are reduced by the presence of HIV<sup>[7]</sup>.

Clinicians caring for HIV/HBV co-infected patients are facing several issues in terms of therapeutic management: the efficacy of antiviral drugs is generally lower than in HBV mono-infected patients; the emergence of viral resistance and consequent viral failure is a constant concern; and drugs with dual activity

prove to be beneficial in terms of treatment simplification, but are more difficult to manage when HIV or HBV resistance occurs<sup>[6]</sup>.

The goal of HBV therapy in patients with HIV/HBV co-infection is the prevention of liver disease (e.g., cirrhosis and hepatocellular cancer), which may be achieved through sustained suppression of HBV replication and clearance of HBeAg. To prevent the development of HIV and HBV drug resistance, agents active against both viruses should be used in combination with other antiretroviral agents. Given the complexity of anti-HBV treatment, decisions in persons with HIV and limited data regarding the safety and efficacy of the available anti-HBV drugs and combination regimens, the decision to treat HBV must be individualized<sup>[10]</sup>.

End stage liver disease is currently a major concern among HIV positive individuals due to co-infection with hepatotropic viruses<sup>[7]</sup>. HIV infected patients with multiple hepatitis virus infections have a higher rate of liver related morbidity and mortality, than patients with HIV infection alone or with a single hepatitis virus infection. The degree of immunodepression is an important factor in liver disease progression<sup>[11]</sup>.

Screening of HIV patients for HBsAg is of importance. All high risk groups should be compulsorily vaccinated, blood samples should be effectively screened before transfusion.

## CONCLUSIONS

HBV prevalence among HIV infected individuals is more, compared to blood donors. Patients with HIV-HBV coinfection tend to have high levels of

HBV DNA and more advanced histologic disease, but with relatively limited elevations of aminotransferase activity. Three major concerns that could affect future generations of co-infected patients arise from the impact of emerging HBV viral mutants on immunization strategies, the access to innovative hepatocellular carcinoma(HCC) treatment and liver transplantation in a population more prone to succumb to fatal outcomes from end stage liver disease(ESLD).

## REFERENCES

1. Sandhya et al. Seroprevalence of hepatitis b virus markers in patients attending to a tertiary care hospital in kanchipuram, india, Disease, 2013, 3(7), 15-17.
2. Sood and malvankar: seroprevalence of hbsag, anti-hcv ab, and anti-hiv ab, indian journal of community medicine / vol 35 / issue 1 / january 2010
3. Mustafa alhaji isa et al Prevalence of serological marker for chronic hepatitis b virus among patients attending Sokoto specialist hospital, Sokoto, Nigeria. J. Microbiol. Biotech. Res., 2013, 3 (3):122-125.
4. B.sreekanth et. Al. The rate of tuberculosis infection in hiv positive patients in relation to cd4 count, journal of evolution of medical and dental sciences/ volume 2/ issue 21/ may 27, 2013

5. Usha arora, amith mann. Prevalence of hepatitis b virus, hepatitis c virus, and Hiv in patients of chronic liver disease in amritsar, *jiacm* 2007; 8(1): 29-31
6. K. Lacombe et al. Hiv/hepatitis b virus co-infection: current challenges And new strategies, *j antimicrob chemother* 2010; 65: 10–17
7. S.S.Tankhiwale et al. Seroprevalence of anti-hcv and hepatitis b surface antigen in hiv infected patients, *indian journal of medical microbiology*, (2003) 21 (4):268-270
8. Tiwari b r, ghimire p, kandel s r, rajkarnikar m. Seroprevalence of hbv and hcv in blood donors: a study from regional Blood transfusion services of nepal. *Asian j transfus sci* 2010; 4:91-3
9. Jayeeta sarkar et al. Hiv-hbv coinfection among individuals attending the ictc of a tertiary care hospital in west bengal, india, <http://dx.doi.org/10.5402/2013/180150>.
10. Athe m. N. Tsibris, martin s. Hirsch. Antiretroviral therapy for human immunodeficiency virus infection, mandell, douglas, and bennett's Principles and practice of infectious diseases, seventh edition. 1833-1882.
11. Ganesh kumar anbazhagan et al. Seroprevalence of hcv and its co-infection with hbv and hiv among liver disease patients of south tamil nadu, *world j hepatol* 2010 january 27; 2(1): 42-48