

**ORIGINAL RESEARCH**

# Co-infection of hepatitis B among HIV-infected patients: A cross-sectional study from tertiary care hospital

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## Abstract

In tertiary care hospitals of Madhya Pradesh, despite declining HIV prevalence, co-infections like Hepatitis B (HBV) pose a challenge. Examining 445 HIV-positive patients over a year, researchers identified 1.8% co-infection rate with HBV, lower than global estimates and previous Indian studies. This highlights the need for regular HBV screening in high-risk groups and careful vaccination strategies. While the study's prevalence was lower than expected, managing co-infected individuals remains complex.

**Keywords:** HIV, Hepatitis B, co-infection, prevalence, screening, vaccination and epidemiological patterns

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## Introduction

Nationally, HIV incidence was estimated at 0.04 (0.02–0.09) per 1,000 noninfected population in the calendar year 2020. It declined from 0.57 per 1,000 noninfected population in 1997 through 0.09–0.10 in 2009–10 to 0.04 in 2020, corresponding to a 56% decline in the last decade. An estimate of 726 PLHIV per million people in Madhya Pradesh was made in 2020 [1]. Along with these, recipients of multiple blood transfusions are also included in the high risk group. In addition to HIV, there are various co-infections and co-morbidities, including other Sexually Transmitted Infections (STIs), Reproductive Tract Infections (RTIs), Tuberculosis (TB), Hepatitis B and Hepatitis C. Time to time analysis of HIV infected population for co-infections and common risk factors that exist in a certain geographical area, is therefore important to ensure early detection along with management of existing as well as new cases, which will lead our country towards the goal of becoming an HIV-AIDS free nation. Infections like Human Immunodeficiency Virus (HIV), syphilis & Hepatitis B Virus (HBV) are sexually transmitted infections [2].

**AIM:** Aim of our study is to find out the proportion of Hepatitis B Co-infection among HIV positive individuals at ICTC and PPTCT center of tertiary care setup.

## Methodology

This study was conducted in the Department of Microbiology of a tertiary care hospital over a period of 1 year from August 2021 to July 2022. It was a prospective cross sectional study. We have followed NACO Strategy III for testing of HIV among all individuals attending the ICTC and PPTCT center of our Institute. All participants who have given written consent for HIV testing after Pre-test counseling were recruited for the study.

Individuals found positive for HIV by 03 tests strategy were further tested for Hepatitis B infection using a Rapid immunochromatographic Lateral flow assay based Kits HEPACARD (Manufacturer: Avantor Performance) to detect Hepatitis B surface antigen. Individuals with history of current or past treatment for Hepatitis B were excluded from the study. The study protocol was approved by the ethics committee of the institution. A total of 10666 individuals have visited our ICTC and PPTCT center during the study period for HIV screening. Out of total

tested individuals 445 person found positive for HIV and included in the study for further testing to Hepatitis B.

**Collection of specimen:** For serological assays, 4–5 ml of blood was collected aseptically by venepuncture. The collected blood was allowed to clot; serum was separated by centrifugation at room temperature and used for HIV antibody and Hepatitis B testing.

**Laboratory diagnosis:** Diagnosis of HIV infection was performed using 3 test strategies of NACO for HIV testing using 03 kits based on different antigens and test principles after batch validation of kits.

For diagnosis of Hepatitis B, serum samples were screened by a Rapid Immunochromatographic assay after batch verification of kit with known positive and Negative controls. Samples found Reactive by test were considered positive for Hepatitis B.

### Result and Discussion

In our study out of 10666 individuals tested for HIV, 445 were found Positive for HIV - 1 antibody (Table-1&2). This comprise 4.17% of the total tested. Sherwa *et al.* found that out of the total 25413 clients attending ICTC, 963 (3.78%) were found to be HIV positive. In other words we found that almost 4 per 100 individuals are HIV positive<sup>[3]</sup>. This is in agreement with a study done by Kabita *et al.* from the Southeastern region who reported the HIV positivity rate to be 4.12% in 2012, 4.61% in 2013 and 4.36% in 2014<sup>[4]</sup>.

The demographic characteristics of the study population are given in Tables 3/4. In our study 291 (65.39%) of patient were in the age group 19-40 years while the study conducted at SMS medical College Jaipur by Jain C *et al.* concluded that 51% of patients were from this age group<sup>[5,6]</sup>. In our study the number of male clients was higher 295 (66.29%) than female

clients 146 (32.8%) followed by transgender clients 4 (0.9%).

Sherwal B *et al.* also reported the same finding i.e. higher HIV positivity in male clients i.e. 625 (64.4%) than female clients 336 (34.8%) followed by transgender clients 2 (0.2%)<sup>[3]</sup>.

In the present study, 8 (1.80%) out of 445 HIV positive individuals had HIV-Hepatitis B co-infection. Across the world, studies have estimated that 10 to 28% of HIV-infected individuals are chronically infected with HBV. HIV-HBV coinfection in China varies between regions from 5% to 15%<sup>[7]</sup>. A meta-analytical study stated the prevalence of HIV- HBsAg co-infection to be 7.6%. Also, in a large cohort of 19,408 HIV infected sub-Saharan African patients, 453 (2.5%) were HIV-HBV co-infected<sup>[8,9]</sup>. In a cross sectional study by Shrestha LB *et al.* in a tertiary care hospital of eastern Nepal, out of 474 HIV-positive patients, HIV- HBV co-infection was seen in 2.95% (14/474). D 20 K. A. Bosh *et al.* reported that 2.0% were coinfecting with HIV HBV<sup>[10,11]</sup>. The proportion of HIV-HBV co-infection was estimated at 7.7% by Chiaw Yee Choy *et al.* and Shanmugam Saravanan *et al.* in the year 2007 from south India reported 11.1% of coinfection, 144<sup>[12,13]</sup>. The estimated prevalence of HBV coinfection in a cohort of Asian HIV-infected children and adolescents on ART was found to be 5.2% by Linda Arbipulet *et al.*<sup>[14]</sup>. Justine Umutesi *et al.* showed 182 (0.2%) HIV positive individuals to be co-infected with HBV (130).

### Conclusion

In the current Study we have considered 445 HIV positive patients in all age groups and gender. We found 8 HBV-HIV coinfection. This can be prevented by Regular screening in high risk groups and implementation of careful vaccination protocol against HBV. Management of HBV positive with Management of HIV infected will be challenging.

**Table1: HIV Positivity among person attending ICTC**

Total samples tested	Number of HIV positive Individuals	Percentage
1607	406	25.27%

**Table2: HIV Positivity among person attending PPTCT**

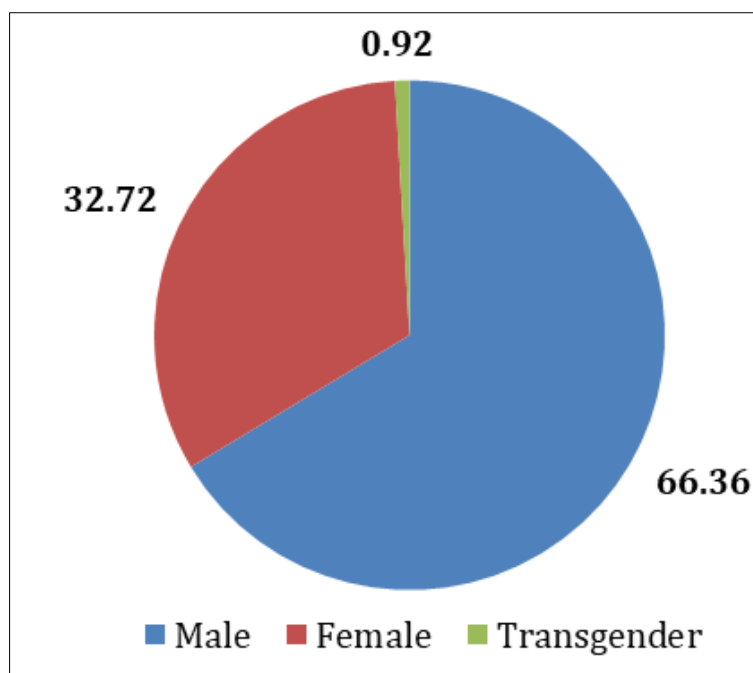
Total sample tested	Number of HIV positive Individuals	Percentage
8525	13	0.15%

**Table3: Distribution of HIV infection with respect to Age**

Age (in years)	Number of HIV Positive individuals (n=445)	Percentage
<15	9	2.02
15-49	366	82.25
>49	70	15.73

**Table4: Gender wise distribution of Individual with HIV - Hepatitis B Co-infection**

Gender	Number of Individuals	Percentage
Male	5	62.5
Female	3	37.5
Total	8	100



**Fig 1:**Percentage of Gender distribution amongHIV infected person

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