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**CO-INFECTION OF HUMAN IMMUNODEFICIENCY VIRUS AND HEPATITIS B VIRUS IN BELLARY, INDIA**Sathyanarayan M.S.<sup>1</sup>, Suresh B. Sonth<sup>2</sup>, Mariraj J.<sup>3</sup>, Krishna S.<sup>3</sup><sup>1</sup>Department of Microbiology, Bangalore Medical College and Research Institute, Bangalore, India<sup>2</sup>SN Medical College, Bagalkot, KA, India<sup>3</sup>Vijayanagar Institute of Medical Sciences, Bellary, KA, India

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**ABSTRACT**

**Introduction:** Hepatitis B is a common infection worldwide. Hepatitis B Virus and HIV share common modes of transmission and infection risk groups. Many HIV-positive individuals have also been exposed to hepatitis virus (HBV). The present study was undertaken to estimate the prevalence of HBsAg in HIV positive individuals attending VIMS, a tertiary care centre in Bellary, Karnataka.

**Materials and methods:** A total of 875 individuals comprising of 440 males and 435 females HIV positive individuals referred from Anti Retroviral Therapy (ART) centre were screened for HBsAg in the serology section of the Department of Microbiology over a period of six months from January to June 2009. Serum samples collected from the patients included under the study were tested using HBsAg Immunochromatography rapid kits (Beacon Diagnostics) as per the manufacturer's guidelines. The kits show a control line and test line in positive cases and only a control line in negative cases.

**Results:** 46 serum samples tested positive for HBsAg (5.26%), of whom 26 were males and 20 were females. 27 of the 46 positive cases (58.69%) were in the age group of 31-40, of whom 20 were males and 7 were females.

**Conclusion:** The present study showed a high percentage of HIV positive individuals in Bellary having co-infection with HBV with a predilection to males of sexually active age group. We recommend that all HIV positive individuals must be screened for HBV co-infection.

**Keywords:** HIV, HBsAg, co-infection, prevalence.

**INTRODUCTION**

Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV) infections exhibit similar modes of transmission in man and infection risk groups. Both these infections are associated with significant morbidity and mortality.<sup>1</sup>

The modes of transmission include unsafe sexual practices, by percutaneous or permucosal routes due to use of contaminated syringes among intravenous drug users, invasive medical manipulations in health care facilities, needle stick injuries among health care personnel, use of contaminated blood and blood products.<sup>2,3</sup> These modes are associated with varying rates of transmission. The possibility of co-infection of HIV and HBV is

therefore high and the same has been reported in a number of studies.<sup>4,5,6</sup>

According to the 2009 National AIDS Control Organization (NACO) statistics, there were 2.39 million people living with HIV/AIDS (PLHA) in India with an adult prevalence of 0.31%. Karnataka is considered as a high prevalence state and has reported an adult HIV prevalence of 0.63% during the year 2009, with 9184 new infections. Bellary district reportedly has a high prevalence of HIV positive cases and is considered as a category A district by NACO, implying that the prevalence of HIV in antenatal women is over 1%.<sup>7</sup>

HIV is known to significantly alter the course of HBV, whereas the presence of HBV does

not greatly affect the course of HIV.<sup>6</sup> The prevalence of HIV-HBV co-infection has been reported to range from 5.3% to 24.91% in many studies.<sup>2,6,8,9</sup> In the presence of HIV, HBV is known to have a higher viral load and can result in greater hepatic damage.<sup>10</sup> The present study was undertaken to estimate the prevalence of HBsAg in HIV positive individuals attending Anti-Retroviral Therapy (ART) unit in Vijayanagar Institute of Medical Sciences, a tertiary care centre in Bellary, Karnataka and also to determine the association of HIV-HBV co-infection with age and gender of the population under study.

### MATERIALS AND METHODS

A total of 875 heterosexually transmitted HIV positive individuals referred from ART centre were screened for HBsAg in the serology section of the Department of Microbiology over a period of six months from January to June 2009 in the present study after noting their gender and age. The study population included 440 males and 435 females. The HIV status of the subjects were confirmed by a testing algorithm using three different assays according to NACO guidelines.<sup>11</sup> Serum samples collected from the patients included under the study were tested using HBsAg Immunochromatography rapid kits (Beacon Diagnostics) as per the manufacturer's guidelines. The kits show a control line and test line in positive cases and only a control line in negative cases. Internal quality controls were tested at least once a day to validate results of the immunochromatographic tests.

**Statistical Methods:** Statistical significance was calculated using Chi-square test.

### RESULTS

In the present retrospective study, out of the 875 serum samples from HIV positive individuals included, 46 samples were determined to be positive for HBsAg (5.26%) by the immunochromatography method. Of these, 26 were from males (5.91%) and 20 from females (4.60%) with a Male to Female ratio of 1.3:1 (Table 1). The difference among

the genders was not found to be statistically significant ( $\chi^2=0.7553$ ; p value- 0.3848). Majority of the cases of co-infection were detected in the age group of 31-40 (27 of the 46 total cases, amounting to 58.69%), of whom 20 were males (74.07%) and 7 were females (25.93%) (Table 2).

### DISCUSSION

HIV is a RNA virus belonging to the Retroviridae family while HBV is a DNA virus belonging to Hepadnaviridae family. However, these viruses share similar modes of transmission. Co-infection with HIV and HBV is known to affect clinical outcomes in patients. The finding of 5.26% prevalence of co-infection in the present study is comparable to those of D.W. Taura et al, Abdel-kader and Saillour et al, who have reported prevalence of HIV-HBV co-infection of 6%, 6.3% and 6.9% respectively.<sup>12,13,14</sup> The prevalence of HIV-HBV co-infection is noted to be varying across geographical locations, though the modes of transmission of these infections are the same. The prevalence of HIV-HBV co-infection has been reported to be as higher than 20% in a few studies.<sup>6,9,15,16</sup> It has been reported that a very high percentage of HIV positive individuals have evidence of past or current HBV infection.<sup>6,17</sup>

In the present study, the prevalence of HIV-HBV co-infection was noted to be 4.60%, which is comparable to the findings of D.W.Taura et al.<sup>12</sup> Females are reportedly more prone for infection with HBV as they are exposed to greater risks like contact with contaminated surgical instruments and utensils as part of house hold work, invasive procedures like ear piercing and tattooing which renders them vulnerable to contact with potentially infected blood and blood products.<sup>12</sup> A previous study by Sonth SB et al in Bellary suggests a statistically significant difference in the prevalence of HBV infection among HIV positive individuals as compared to that among healthy blood donors.<sup>6</sup> The co-infection of HBV in HIV positive individuals is significant owing to an increased risk of

progression to severe liver diseases and antiretroviral therapy associated hepatotoxicity.<sup>18</sup>

## CONCLUSIONS

The present study revealed a high prevalence of HBsAg among HIV positive individuals with a predilection to males of sexually active age group. It is recommended that all HIV positive individuals must be screened for presence of HBV co-infection. Efforts have to be made to target the sexually active age group in particular for screening as well as educating this vulnerable group to limit the extent of HIV-HBV co-infection as both these infections share common modes of transmission. Hepatitis B immunization offered in health care delivery systems may help in lowering the burden of HBV infections.

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**Table 1: Prevalence of HBsAg in HIV positive individuals with reference to their gender**

Gender	No. of HIV positive individuals	No. of HBsAg positives	%	No. of HBsAg negatives	%
MALE	440	26	5.91	414	94.09
FEMALE	435	20	4.60	415	95.40
TOTAL	875	46	5.26	829	94.74

**Table 2: Sex distribution among cases of HIV-HBV co-infection in the 31-40 years age group**

Total no. of cases of co-infection in the age group	Male	%	Female	%
27	20	74.07	7	25.93