**Research Article** **Medical Sciences**

**International Journal of Pharma and Bio Sciences** **ISSN 0975-6299**

# CO- INFECTION AND RISK FACTOR OF HEPATITIS B AND HEPATITIS C VIRUS IN HIV INFECTED PATIENTS IN CENTRAL INDIA

**DR. RAJENDRA KUMAR JAIN*[1], DR. HIMANSHU SHARMA[2], DR. VIRENDRA KUMAR SHARMA[3] AND DR. SHWETA SHARMA[4]**

*[1]Prof. & Head, Gastroenterology, Department of Medicine Gandhi medical college Bhopal M.P. India.*
*[2]Assistant Prof. Medicine Department of Medicine Gandhi medical college Bhopal M.P. India.*
*[3]Prof. & Head, Department of Medicine Gandhi medical college Bhopal M.P. India.*
*[4]Medical officer ART Centre, Gandhi medical college Bhopal M.P. India.*

## ABSTRACT

Improved survival due to success of highly active anti retroviral therapy (HAART) has enabled chronic viral hepatitis to become a major source of co-morbidity in Human Immunodeficiency Virus (HIV) infected population. Presently Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV) co infection prevalence is unknown in central India, so we evaluated HBV and HCV prevalence and risk factors among HIV positive patients attending Anti Retroviral Treatment (ART) centre. Out of 1500 cases (median age 33 Years, 68% male, M: F; 1020:480). HBV/HIV co-infection in 45/1500 (3%), HCV/ HIV co-infection in 25/1500 (1.7%) and triple infection (HBV/HCV/HIV) in 3/1500 (0.2%) patients. Most common route of transmission (60%) was unsafe sex in HBV co infection and history of intravenous drug use (IDU) in other two groups. Prevalence of HBV and HCV in HIV positive patients is low in central India. Screening for these viruses in all the HIV infected individuals and their sexual partners should be done at the earliest.

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**KEY WORDS:** **Hepatitis B virus; Hepatitis C virus; Human immunodeficiency virus; co infection.**

**DR. RAJENDRA KUMAR JAIN**
**Prof. & Head, Gastroenterology,**
**Department of Medicine Gandhi medical college Bhopal**

***Corresponding author**

## INTRODUCTION

The Human immunodeficiency virus (HIV), Hepatitis B (HBV) and Hepatitis C (HCV) viruses co-infection is relatively common due to similar route of transmission and it increases with number of high risk behaviour[1]. Improved survival due to success of highly active anti retroviral therapy (HAART) has enabled conditions with long latency such as chronic viral hepatitis to become a major source of co-morbidity in HIV infected population[2]. HIV modifies the natural history of hepatitis B, with higher rate of chronicity, replicative disease and progression to advanced liver disease among HBV and HIV co-infection [2]. The impact of HBV infection on HIV natural history is less certain[3,4].HIV also modifies the natural history of HCV infection, with clear evidence of higher HCV viral load and accelerated liver disease progression in patients with HCV and HIV co infection[5]. Joint United Nations Program on HIV/AIDS (UNAIDS) estimated that 34 million people were living with HIV globally at the end of 2011[6], where as there were more than 2.09 million people living with HIV in India by the end of 2011 with the prevalence of 0.27%[7]. Whereas in central India the prevalence of HIV was 0.09% as per NACO reports[8]. The data from western studies revealed the incidence of HBV co-infection as 9-12%[9,10] and HCV co-infection as 9-16%[11,12]. The prevalence of HCV co-infection is higher in IDU while it is low when HIV occurred through sexual activity[13,14]. The progression of liver disease seems to be further accelerated in HIV patients co-infected with HBV and HCV[15]. Seroprevalance of HBV, HCV and HIV in healthy voluntary blood donors was found to be 2.9%, 0.56% and 0.51% respectively in central India[16]. Present study aimed to assess the seroprevalance and risk factors of HBV and HCV co-infection in HIV patients in central India.

## METHODS AND MATERIALS

This retrospective study was conducted at ART Centre, Gandhi Medical College, Bhopal and included patients (April 2008 to April 2011) who were HIV positive, tested at integrated counselling and testing centre (ICTC), Microbiology Department under National AIDS Control Organization (NACO) guidelines. Detailed history and clinical examination in reference to age, sex, possible mode of transmission, education status, opportunistic infections, history of smoking, alcohol, occupation and socioeconomic status along with baseline investigations like complete hemogram, biochemistry, CD4 count, presence of HBV and HCV infection (by enzyme linked immune sorbent assay) was analysed from patient's recorded data. Statistical analysis of data collected was done by basic statistical methods like mean, median and percentage.

## RESULTS

Fifteen hundred HIV positive patients were analysed. Forty five (3%) patients had HBV co-infection, 25 (1.7%) patients had HCV co-infection and 3 patients had triple infection HBV, HCV and HIV. Out of 45 HBV and HIV co infection (35 male and 10 female), history of unsafe sex (Heterosexual) was present in 27 cases (60%), intravenous drug use (IDU) in 06 cases (13.3%), unsterilized needle prick in 06 cases (13.3%), blood transfusion in 03 cases (6.7%), transmission from mother to child was in 1 case (2.2 %) while unknown in 02 cases (4.4%). The mean CD4 count was 287.5 cells / $mm^3$, out of 45 patients 22 were in stage I of WHO staging. Out of 25 HCV & HIV co-infection (24 male and 1 female) , risk factor were unsafe sex (Heterosexual) in 4 cases (16%), IDU in 18 cases (72%), unsterilized needle prick in 01 case (04%), blood transfusion in 01 case (04%) while unknown in 01 case (04%). The mean CD4 count was 435.3cells/$mm^3$, out of 25 patients 16 were in stage I of WHO staging. Three patients had triple infections, mode of transmission was by IDU in 2 cases (66.7%) and unsafe sex in one case (33.3%). The mean CD4 count was 566.3 cells /$mm^3$, out of 3 patients 2 were in stage I of WHO staging.

## DISCUSSION

The prevalence of HBV and HCV co-infection in HIV patients has been variably reported in various studies worldwide. In the EUROSIDA

STUDY[9] and MACS COHORT STUDY[10], the prevalence of HIV and HBV co-infection was reported as 9% and 12.7% respectively. In the CAESAR STUDY[11] and CPCRA STUDY[12] the prevalence of HIV and HCV co-infection was found to be 9% and 16.1% respectively. In another study from Tehran[17], 44.3% and 67.3% HBV and HCV prevalence in HIV patients was due to IDU as route of transmission. In our study we have found a lower prevalence of HBV and HCV co-infection as 03% and 1.7% respectively, which is very similar to studies from north India (Lucknow & Delhi)[18,19], with the reported prevalence of HBV and HCV co-infection as 2.25% and 1.61% and 5.3% and 2.4% respectively, while other two studies from south India reported prevalence of HBV and HCV co-infection as 6.4% and 2.1% and 09% and 2.2% respectively[20,21]. Similar studies One of the studies from Western India, (Ahmadabad) reported the prevalence of HBV and HCV in PLHA's to be 3.34% and 2.75% respectively[22]. The prevalence of co-infection varies according to mode of transmission and prevalence of HBV and HCV in a particular geographical area. In North east India where the HIV is predominantly transmitted through intravenous drug use (IDU), the prevalence of HIV and HCV co-infection was reported as high as 50-90%[23], and another study from East India, (Kolkata) reported very high prevalence of 15.19% and 7.35% for HBV and HCV co infection respectively in HIV patients[24]. In our study HBV co-infection was common in patients with history of unsafe sex and HCV co-infection was common in patients with history of IDU. Injection drug use is the major risk factor for HCV infection.Between50%-80%of IDUs become infected with HCV within 5 years of beginning of injection drug use ; it is usually the first blood-borne virus they acquire. IDUs often jointly purchase drugs and prepare the drug solution together; this solution is divided among users. Sharing the drug solution, syringes, or other drug preparation equipment (such as water, drug mixing containers and cotton filters) all increase the risk of transmission if any of these components are infected with HCV[25]. The prevalence of HBV, HCV and HIV triple infection in our study was low 0.2% and it's very similar to 0.16% and 0.42% as reported from Lucknow and Chennai respectively[18,20]. Triple infection was more common in intravenous drug users. Further study is needed to find out prevalence of HBV DNA and HCV RNA in all HIV positive (PLHA's) patients because infection can be missed by ELISA testing due to poor immune status of these patients[19].

**TABLE 1**

| GROUPS | TOTAL | AGE | SEX | | ROUTE OF TRANSMISSION | | | | | | MEAN CD4 | WHO STAGE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | F | SEXUAL | IDU | BLOOD | UNSAFE NEEDLE | MOTHER TO CHILD | UN-KNOWN | | I | II | III | IV |
| HIV/HBV | 45 | 35.6 | 35 | 10 | 27 | 06 | 03 | 06 | 01 | 02 | 287.5 | 22 | 04 | 08 | 11 |
| HIV/HCV | 25 | 34.0 | 24 | 1 | 04 | 18 | 01 | 01 | - | 01 | 435.3 | 16 | 05 | 02 | 02 |
| HIV/HBV/ HCV | 03 | 32.7 | 3 | 0 | 01 | 02 | - | - | - | - | 566.3 | 02 | 01 | - | - |

## CONCLUSION

As the survival of HIV patients prolonged by the use of HAART, the co infection with HBV or HCV may become an important clinical problem. The knowledge of the co infection of HBV/HCV in PLHA's is of good help in management of these patients. Further longitudinal studies are required to assess the impact of HBV and HCV on HIV disease progression in the era of HAART.

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