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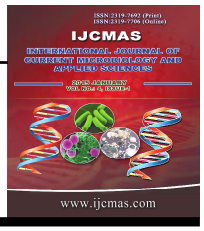


**Original Research Article**

# Seroprevalence of Blood Borne Viral Infections in a Tertiary Care Centre in Remote Settings of Mewat, Haryana, India

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**A B S T R A C T**

Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) are public and global health problems. The study of seroprevalence is important to assess magnitude of disease transmission and aid in devising preventive measures. To estimate seroprevalence of HIV, HBV and HCV infections in different age groups and both the sexes in patients at Shaheed Hasan Khan Mewati, Government Medical College (SHKM, GMC), Nalhar, Mewat, Haryana. This was a retrospective study carried out on hospital based population in SHKM, GMC, Nalhar from January 2013 to June 2013. The sera of patients were initially tested for presence of anti- HIV antibodies, HbsAg antigen and anti-HCV antibodies using Enzyme linked immuno-sorbent assay (ELISA) followed by Rapid immunoassay card test. The seroprevalence of anti-HIV antibodies was found to be 1.25 %, of HbsAg was found to be 5.3% and of anti-HCV antibodies as 0.68 %. The seroprevalence of HIV, HBV and HCV among the patients in this study was similar to other studies reported from India. The study indicates magnitude of viral transmission among population of Mewat, Haryana.

**Keywords**

Haryana, Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus, Seroprevalence

## Introduction

HIV, HBV and HCV are serious public and global health problems and significant causes of mortality & morbidity throughout the world.

Data from India suggests that, about 0.36% of population is HIV infected, 2.4% (extending to 15.9% to certain population groups) are HBV infected and 1.2% are infected with HCV as reported by Batham *et al.* (2007); NACO (2013); SEARO (2013). Jawetz *et al.* (2013) reported that Human Immunodeficiency Virus (HIV) is a retrovirus, a member of *Lentivirus* genus. HIV types, derived from primate lentiviruses, are the etiologic agents of Acquires Immuno Deficiency Syndrome (AIDS). AIDS is one of the most important public health problems caused by HIV worldwide at the start of the 21st century. The World Health Organization estimates that of all the new HIV infections each year, 90% are occuring in developing countries.

In these countries, AIDS is overwhelmingly a heterosexually transmitted disease, and there are about equal number of male and female cases. HIV drugs can be used for prevention of infection. There is currently no vaccination against HIV available.

Heptitis B Virus (HBV), genus *Orthohepadna* virus, belongs to Hepadnaviridae family. It is worldwide in distribution. Worldwide 1 million deaths a year are attributed to HBV- related liver disease and hepatocellular carcinoma. It is highly infectious viral disease and can be transmitted either through blood transfusion, vertical transmission, homo or heterosexual contact or through percutaneous route. Appearance of hepatitis B surface antigen (HbsAg) indicates active HBV infection. Due to its chronic sequelae e.g. chronic hepatitis, cirrhosis and hepatocellular carcinoma; millions of people are dying annually as reported by Jawetz *et al.* (2013). India is said to have an intermediate prevalence range of 2-7% (World Health organization) by Qamer *et al.* (2004) Effective vaccination is available since 1982 as observed by Jawetz *et al.* (2013)

Hepatitis C virus (HCV), genus *Hepacivirus* and is a member of Flaviviridae family. Infections by HCV are extensive throughout the world. Chronic Hepatitis C is a ubiquitous disease affecting around 200 million people worldwide.

The direct percutaneous exposure to blood and blood products account for major route of transmission of this infection. The presence of anti-hepatitis C antibody (anti-HCV ab) points out the previous exposure to hepatitis C virus as reported by Jawetz *et al.* (2013).

This is first study conducted to determine the seroprevalence of HIV, HBV and HCV among hospital-based population in Haryana state.

## Materials and Methods

This retrospective study was carried out in the Department of Microbiology, Shaheed Hasan Khan Mewati, Government Medical College, Nalhar, Mewat, Haryana from January 2013 to June 2013.

The OPD/ IPD patients of this hospital, who were advised to undergo HIV, HBsAg and anti- HCV antibody testing as a part of preoperative screening, antenatal screening and clinically suspected cases of these infections were included in the study. In our hospital, before HIV antibody testing, a pretest counseling and informed written consent was obtained from all the patients as per NACO guidelines. Permission from institutional ethical committee was taken for conducting this study. Two mL of blood was collected and Enzyme Linked Immuno-Sorbent Assay (ELISA) test was done followed by Rapid card test.

ELISA kits used were- 4$^{TH}$ Generation MICROELISA HIV Ag & Ab kit manufactured by J. Mitra & Co. Pvt. Ltd for detection of Anti HIV antibodies and antigen. SD HbsAg ELISA 3.0 and SD HCV ELISA 3.0 kits manufactured by Biostandard Diagnostics, Pvt Ltd for detection of HbsAg and anti-HCV antibodies.

Rapid card tests used were- 4$^{TH}$ Generation HIV TRI-DOT + Ag kit manufactured by J. Mitra & Co. Pvt. Ltd for detection of Anti HIV antibodies and Ag, SD Bioline HbsAg and SD Bioline HCV kits manufactured by Biostandard Diagnostics, Pvt Ltd for detection of HbsAg and anti-HCV antibodies.

## Result and Discussion

Out of 2872, 2880 and 1621 sera tested over a period of six months i.e. from January 2013 to June 2013, prevalence of 1.25%, 5.3% and 0.68% was found among patients positive for anti-HIVantibodies, HBsAg and anti-HCV antibodies respectively. Tables 1, 2 & 3 show age and sex distribution of hospital-based population with HIV, HBV and HCV seropositivity, respectively.

Prevalence was higher in females as compared to males i.e. 0.77% vs. 0.49% and 2.9% vs. 2.4% for anti-HIV antibodies and HBsAg respectively whereas it was more in males as compared to females for anti-HCV antibodies i.e. 0.37% vs. 0.3%.

Analysis of age distribution of anti-HIV antibodies revealed a relative high prevalence of 1.73% among 21-30 years age group for both sexes. For HBsAg positivity, 3.6% prevalence was noted for males within age group of 11–20 years and 3.4% prevalence among females within age group of 21–30 years. For Anti HCV antibodies, 1.1% prevalence was highest among males in the age group of 51–60 years and 1.7% among females of 61–70 years.

The seroprevalence of anti-HIV antibodies in our study was found to be 1.25% which matches with study conducted in Puducherry (1.26%) by Shivekar *et al.* (2012). Similar prevalence rate was also observed in Puducherry, NACO (2.26%); in Tamil Nadu by Balaji *et al.*, (2008), in Andhra Pradesh (2.95%) by Teja *et al.* (2008). A lower prevalence rate was observed in Jaipur by Sood *et al.* (2010) as 0.35% and in Varanasi by Mukhopadhya *et al.* (2001) as 0.37%. The seroprevalence of hepatitis B surface antigen of 5.3% was noted in our hospital-based population. It was reported that prevalence of HbsAg surface antigen in non tribal population in India is 2.4%, whereas a very high prevalence of (15.96%) was observed among tribal population of India by Batham *et al.* (2007). The prevalence rate of viral hepatitis B was found to be 2.5% in study by Bhatta *et al.* (2003), 2.28% by Chaudhary *et al.* (2007), 0.87% reported by Sood *et al.* (2010), 1–2% in a study by Lodha *et al.* (2001). The seroprevalence of HCV among our hospital-based population was found to be 0.68% which is similar to study conducted at Jaipur by Sood *et al.* (2010) i.e. (0.28%). In India, the seroprevalence of HCV varies among hospital-based populations with 1.57% in Cuttack by Mishra *et al.* (2002), 2.46% in Jodhpur (Rajasthan) reported by Qamer *et al.* (2004) and 4.8% in Pondicherry by Bhattacharya *et al.* (2003).

In the present study, females showed a higher HIV seropositivity than males. It may be due to inclusion of more females than male subjects. In the present study, HbsAg seropostivity showed a male predominance which matches with study by Shivekar *et al.* (2012), Dutta *et al.* (1994) and Sood *et al.* (2010) which also showed a male predominance. This may be because as compared to males, females can clear the HBV more efficiently.

In the present study, HCV seropostivity showed a male predominance as seen in a study by Sood *et al.* (2010), Hamdani *et al.* (2012).

In present study, age distribution of anti-HIV antibodies revealed a relative high prevalence among 21–30 years age group, also shown by Shivekar *et al.* (2012). For HBsAg positivity, a high prevalence was noted for males & females within age group of 11-20 years and 21-30 years respectively which also is shown by Shivekar *et al.* (2012), Bhatta *et al.* (2003).

**Table.1** shows prevalence of anti-HIVantibodies, HbsAg and anti-HCV antibodies in Haryana

| Total | Positive for anti-HIV antibodies | Positive for HBsAg | Positive for anti-HCV antibodies |
|---|---|---|---|
| Total sera tested | 2872 | 2880 | 1621 |
| Percentage of positive cases (%) | 36 (1.25%) | 153 (5.3%) | 11 (0.68%) |

**Table.2** Male female ratio amongst positive cases

| Total | Positive for anti-HIV antibodies | Positive for HBsAg | Positive for anti-HCV antibodies |
|---|---|---|---|
| Total number of positive cases | 36 | 153 | 11 |
| Males (%) | 14 | 69 | 6 |
| Females (%) | 22 | 84 | 5 |

**Table.3** Gender wise and age-wise distribution of positive cases

| Total | Positive for anti-HIV antibodies | | Positive for HBsAg | | Positive for anti-HCV antibodies | |
|---|---|---|---|---|---|---|
| Gender wise and age wise (years)distribution of positive cases | Males | Females | Males | Females | Males | Females |
| 0-10 | 1 | 1 | 13 | 1 | 1 | 0 |
| 11-20 | 2 | 1 | 18 | 18 | 2 | 0 |
| 21-30 | 5 | 11 | 9 | 34 | 0 | 1 |
| 31-40 | 2 | 5 | 6 | 15 | 0 | 1 |
| 41-50 | 2 | 2 | 10 | 10 | 1 | 1 |
| 51-60 | 1 | 2 | 10 | 4 | 2 | 0 |
| 61-70 | 1 | 0 | 1 | 2 | 0 | 2 |
| 71-80 | 0 | 0 | 2 | 0 | 0 | 0 |
| Total number of positive cases | 14 | 22 | 69 | 84 | 6 | 5 |

In the present study the maximum number of cases reactive for HCV antibodies belonged to age groups 51-60 years and ≥61 years results of which match with the study of Sood *et al.* (2010) & Ramarokoto *et al.* (2009). The present seropositivity rate is limited to the patient population served by our hospital and may not applicable to other hospitals/areas. The study the seroprevalence of various diseases in the community can be useful while formulating new policies to combat these diseases.

This is first study of its kind being conducted in North India (Haryana state). The study provides a good reference for

future studies regarding how to lower the existing prevalence rates in this region.

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