



## Senerio of Sero-Prevalence of Hepatitis B Infection in Rular Area in East Uttar Pradesh: A Hospital Based Study

Authors

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### Abstract

**Introduction:** *Hepatitis B virus infection cause for significant health care burden in India and now became threat like other disease – Tuberculosis, Malaria and HIV. The World Health Organization (WHO) estimates that there are 350 million people with chronic HBV infection and 170 million people with chronic HCV infection worldwide. Hepatitis B is estimated to result in 563000 deaths and hepatitis C in 366000 deaths annually.*

**Materials and Methods:** *Serum from 4,415 patients who attended Government Medical College and Hospital, Kannauj was screened for detection HBV surface Ag using the Rapid Card Diagnostic Test (Reckone Diagnostic). All rapid test positive samples were further tested by a third-generation Enzyme linked immune sorbent assay (ELISA).*

**Results:** *The overall sero-prevalence of HBV among patients was 2.28%. A high sero-positivity was prevalent in the age group of 21-30 years (0.88%).*

**Conclusion:** *The sero frequency of hepatitis is high in age group of 21-30 years attending Government Medical College and Hospital, Kannauj, Uttar Pradesh.*

### Introduction

Hepatitis B virus infection cause for significant health care burden in India and now became threat like other disease .Hepatitis is an infection causing swelling and inflammation of the liver and chronic form may lead to cirrhosis or cancer of liver. Hepatitis B virus (HBV) is principal cause of severe liver disease, including hepatocellular carcinoma and cirrhosis-related end-stage liver disease<sup>[1]</sup>. The World Health Organization (WHO) estimates that there are 350 million people with

chronic HBV infection and 170 million people with chronic HCV infection worldwide. Hepatitis B is estimated to result in 563000 deaths and hepatitis C in 366000 deaths annually<sup>[2]</sup>. There are various causative agents of hepatitis include; alcohol, poison, drugs and autoimmunity but most cases of hepatitis infections are caused by viruses persists in the serum for over 6 months. The chronicity of infection varies with age, with the risk being  $\geq 90\%$  in neonates and  $< 5\%$  in adults<sup>[3]</sup>. Based on the prevalence of HBsAg, various

geographic areas in the world are classified as high ( $\geq 8\%$ ), intermediate (2–7%) and low ( $< 2\%$ ) endemicity<sup>[4]</sup>. In India, chronic hepatitis B is acquired predominantly by horizontal transmission in early childhood (mostly from family contacts) and to lesser extent by perinatal transmission. HBV may be transmitted from all body secretions and excretions. However, only blood, body fluids containing visible blood, semen and vaginal secretions represent a risk of transmission. The age of acquisition of HBV is an important determinant of outcome; the earlier the age, the higher the risk of chronicity (e.g.,  $> 90\%$  in new-borns (vertical transmission),  $30\%$  in children aged 2–5 years and  $< 5\%$  in adults). The other mode is parenteral transmission which may occur at any age<sup>[5]</sup>. The hepatitis B virus can survive outside the body for at least 7 days<sup>[6]</sup>. Such patient may act as a source for spreading such infection among health care workers and other patients in hospitals<sup>[7]</sup>.

HBV has a double stranded DNA encoding for three proteins i.e P, X, core and surface proteins. The complex antigen found on the surface of HBV is called Hepatitis B surface antigen (HBsAg). Antibodies against HBV proteins are other immunological markers of infection, of which Anti-Hepatitis B core antigen, Hepatitis B envelope antigen and Hepatitis B envelope antibody are also identified shortly after infection and are important markers of past or present HBV infection<sup>[8]</sup>.

HBsAg appears in serum 2–10 weeks after exposure to HBV and before the onset of symptoms or elevation of serum aminotransferase levels. In self-limiting acute HBV infection, HBsAg usually becomes undetectable in blood after 4–6 months. Persistence of HBsAg for more than six months implies progression to chronic HBV infection. Consequently, HBsAg has been found to be a useful viral marker for both population screening and diagnosis of acute HBV infection or Chronic Hepatitis B infection<sup>[9]</sup>. HBsAg rapid card test is a rapid screening test for the qualitative detection of HBsAg in whole

blood, serum or plasma specimen. The test utilizes a combination of monoclonal and polyclonal antibodies to selectively detect elevated levels of HBsAg in whole blood, serum or plasma<sup>[10]</sup>. While ELISA is an enzymatic immunoassay technique of the “sandwich” type for the detection of HBV in human serum or plasma. The test uses monoclonal antibodies selected for their ability to bind themselves to the various subtypes of HBsAg now recognized by the World Health Organization (WHO)<sup>[11]</sup> and the most part of variant HBV strains<sup>[12]</sup>. Rapid tests for detection of the surface antigen of the hepatitis B virus (HBsAg) utilize a lateral flow device. A major concern in utilizing rapid screening tests is that these tests should have a high degree of sensitivity and a reasonable level of specificity to minimize false positive and false negative results. This hospital based study was designed to check the current senerio of hepatitis B virus infection in rural area in east Uttar Pradesh.

## Material and Method

### Collection of Specimen

A prospective study was conducted from January 2018 to July 2018 in a hospital at Kannauj, Uttar Pradesh, India. A total of 4,415 blood samples were collected and tested for HBsAg in the Department of Microbiology, Government Medical College, Kannauj, Uttar Pradesh, India.

### Sample Processing

Blood samples were collected from 4415 patients, under direct medical supervision by medial vein puncture using 5 ml syringe into plain tube to obtain serum by centrifugation at 5000 rpm for 10 min. Serum was screened for detection HBV surface Ag using the Rapid Card Diagnostic Test (SD Bioline rapid immunochromatographic test for antibody IgG). All rapid test positive samples were further tested at Department of Microbiology, Govt. Medical College, Kannauj, Uttar Pradesh by a third-generation Enzyme linked immune sorbent assay (ELISA).

## Result

A total of 4,415 patients who visited Department of Microbiology, Government Medical College, Kannauj for serological investigations during the period from January 2018 to July 2018, consented to the study were included, 2575 (58.32%) were males and 1840 (41.67%) were females with males females ratio is 1.39:1 (Table - 1). There ages ranged from 11 to 83 years. The prevalence of HBV= 101 (2.28%) (Table- 2). The highest Prevalence was found in laborers and house wives (Table - 3).The prevalence of HBV in male and females (Table - 4).The study group was divided into 8 age groups. High sero positivity was prevalent in age group of 21-30 (0.88%) (Table 5).

**Table - 1:** Gender distribution of patients.

| Gender  | Frequency | Percentage |
|---------|-----------|------------|
| Males   | 2,575     | 58.32%     |
| Females | 1,840     | 41.67%     |

**Table 2:** Overall prevalence of HBV sero-positivity in patients

| Total patients examined |     | HBV Positives |      |
|-------------------------|-----|---------------|------|
| N                       | %   | N             | %    |
| 4,415                   | 100 | 101           | 2.28 |

**Table - 3:** Sero-positivity of HBV by occupation of patients.

| Occupation of patient | No. of patients examined | HbsAg positive patients |       |
|-----------------------|--------------------------|-------------------------|-------|
|                       |                          | N                       | %     |
| House wives           | 1450                     | 32                      | 2.20% |
| Farmers               | 1540                     | 28                      | 1.81% |
| Students              | 600                      | 07                      | 1.16% |
| Labors                | 825                      | 34                      | 4.1%  |
| Total                 | 4415                     | 101                     | 2.28% |

**Table - 4:** Prevalence of HBV by gender

| Sero positive patients | Male |        | Female |        | P valve |
|------------------------|------|--------|--------|--------|---------|
|                        | N    | %      | N      | %      |         |
| HBV positive (n=101)   | 51   | 50.49% | 50     | 49.50% | 0.11*   |

\*Not Significant

**Table - 5:** Prevalence of HBV by age

| Age (Years) | HBV positive (n=101) |       |
|-------------|----------------------|-------|
|             | N                    | %     |
| 11-20       | 11                   | 0.25% |
| 21-30       | 39                   | 0.88% |
| 31-40       | 22                   | 0.5%  |
| 41-50       | 13                   | 0.29% |
| 51-60       | 08                   | 0.18% |
| 61-70       | 06                   | 0.13% |
| 71-80       | 01                   | 0.02% |
| 81-90       | 01                   | 0.02% |

## Discussion

In the present study, the seroprevalence of HBsAg in hospital-based population was found to be 2.28%. According to a systematic review and pooled analysis by Schweitzer et al., on the prevalence of HBsAg covering 161 countries, HBsAg prevalence in India was found to be 1.46% (1.44–1.47)<sup>[13]</sup>. Various studies conducted in the hospital-based population in different parts of India such as in Rajasthan, Andhra Pradesh, and Karnataka the seroprevalence of HBsAg was found to be 0.87%, 1.06%, and 1.63%, respectively which is much less as compared to our study<sup>[14,15]</sup>. The prevalence of hepatitis B varies not only in different regions of our country but also shows inter-country variation, and it depends on as behavioral, environmental, and host factors. In general, it is high in countries with low socioeconomic level and vice versa.

In the present study, the seroprevalence of HBsAg found to be high in age group 21-30. According to Incidental detection of hepatitis B and C viruses and their coinfection in a hospital-based general population in tertiary care hospital of Uttar Pradesh by Agarwal et al., the high prevalence of HBsAg infection also found in age group 25-34. These findings are very much similar to our study<sup>[16]</sup>.

In the present study prevalence of male and female found to be 1.98% and 2.71% respectively. According to study Suhail Latoo et al., prevalence of male and female were 4.8% and 3.8% respectively which is higher than findings of our study. The cause of variation in prevalence of male and female may be epidemiological factor<sup>[17]</sup>.

### Conclusion

The finding of comparatively higher seroprevalence of HBV among the hospital-based population mandates screening of high-risk individuals. Awareness by health education of safe sexual practices and improved safety of blood products are among the most important preventive measures to control HBV infection. It is suggested that early detection of the infection is important to prevent the transmission and better prognosis. Primary care physicians may play an important role in diagnosing the disease in an early stage using the rapid immunochromatographic assays in resource-limited laboratories. Also by educating the people visiting the primary care center about vaccination against the HBV, they will help in the prevention of disease and increase the herd immunity.

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