



SEROPOSITIVITY OF HEPATITIS B IN PATIENT'S ATTENDING INTEGRAL INSTITUTE OF MEDICAL SCIENCES & RESEARCH - A RETROSPECTIVE STUDY

Microbiology

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ABSTRACT

Background: Hepatitis is a general term meaning inflammation of the liver that can cause a range of health problem can be fatal when liver is inflamed or damaged, its function can be affected. The main causes of hepatitis are toxins, blood transfusion, having sex with multiple infected partners, can be severe due to heavy alcohol consumption. However, hepatitis is often cause by a variety of different viruses such as hepatitis A, B, C, D and E. While the all types of viruses can cause liver disease and they can differ in important ways including modes of transmission, severity of the illness, geographical distribution and prevention methods. **Materials & Methods:** It was a two years retrospective study. The data was collected from the records maintained at Department of Microbiology, IIMS&R, Lucknow. **Results:** out of 13476 serum samples were screened for hepatitis B virus 455 (3.37%) were positive with 286 (2.12%) males and 169 (1.25%) females, prevalence of HBsAg was significantly higher in males 4.83% than females 2.23% and highest among age group 45-59 years (25.49%), and lowest among age group >75 years (2.19%). **Conclusion:** The number of higher seroprevalence in male be due to outdoor works, involvement in multiple sexual partners, drug use. Differences in the prevalence of HBV infection in a given population can occur because of use of different ICA based rapid assays.

KEYWORDS

Hepatitis B virus, seropositivity, prevalence, rapid immunoassay kit.

INTRODUCTION:

Hepatitis B virus (HBV) is one of the most important infectious disease worldwide that belongs to the Hepadnaviridae family, and it is a partially double-stranded DNA virus with 40-42 nm in diameter infection that attacks the liver and can cause both acute and chronic liver infections such as cirrhosis and hepatocellular carcinoma.^[1,2,3] The virus must commonly spread by blood- to-blood contact, unprotected sexual contact with infected partner viral exposure during medical procedures such as dialysis and surgeries, injection-drug use that involves sharing needles, syringes, or drug- preparation equipment and needle sticks or exposure to sharp instruments and vertical transmission from mother to child during birth and delivery are the common route of infection with both HBV. Hepatitis B virus is carried in the blood, and various body fluids, such as saliva, menstrual and vaginal discharges, seminal fluid, and various body fluids contaminated with blood.^[4,5]

HBV silently causes liver disease in many carriers which they do not realise that they are infected with the virus. To prevent the chronic liver disease in today's generation many antiviral drugs are present. The drug can prevent the critical consequences due to chronic liver disease. So, timely identification of infected individual and correct treatment with prognosis is important. The diagnosis of HBV is based on serological demonstration of viral markers namely hepatitis B surface antigen (HBsAg), anti- hepatitis B surface (HBs), immunoglobulin M (IgM), anti-hepatitis B core (HBc), antibody and HBV DNA.^[2,3]

A safe and effective vaccine are available which offers a 98-100% protection against hepatitis B. Preventing hepatitis B infection can decrease the complications including the development of chronic disease and liver cancer.^[5]

MATERIALANDMETHODS:

The present study was carried out in the Department of Microbiology, Integral Institute of Medical Science & Research, Integral University, Lucknow, India using rapid immunochromatographic method (Hepacard). It was a retrospective study which was conducted for a period of 2 years (from May 2018 to April 2020).

All the patients of Integral Institute of Medical Sciences and Research came for detection of hepatitis B were registered in serology working register will be included in this study. Also, patient's clinical features data will be studied from case record file of the patients.

RESULTS:

A total of 13476 patients serum samples were screened for hepatitis B virus infection in the department of microbiology, Integral Institute of Medical Science and Research, Lucknow during May 2018 to April 2020 out of which 455 (3.37%) patients were hepatitis B positive and 13021 (96.63%) patients were negative as shown in fig.1

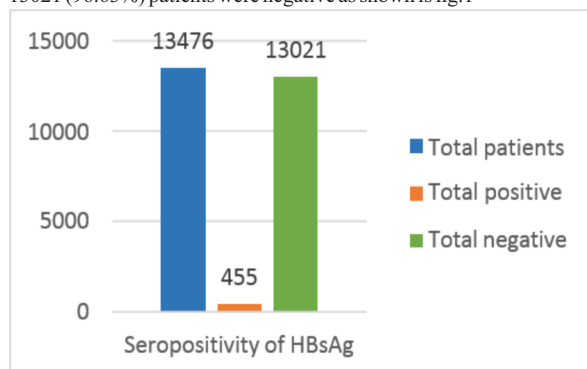


Fig.1. the graphical representation of the patient according to seropositivity of hepatitis B.

In our study 3022 (22.42%) patients were from OPD and 10454 (77.58%) patients were from IPD in which 5919 (43.92%) were males and 7557 (56.08%) were females.

286 (2.12%) males and 169 (1.25%) females were detected with HBsAg in serum as shown in Tab.1. Fig.2. shows that majority of

Tab.1. Distribution of the patients according to gender and seropositivity of HBsAg in serum.

Gender	Number of HBsAg screening test n (%)	Number of HBsAg detected n (%)	χ^2 value	p-value
Male	5919 (43.92)	286 (2.12)	68.5433	0.00001
Female	7557 (56.08)	169 (1.25)		
Total	13476 (100.00)	455 (3.37)		

The chi-square statistic is 68.5433. The p-value is 0.00001. Significant at $p < 0.05$

It was found the study was significant (0.00001)

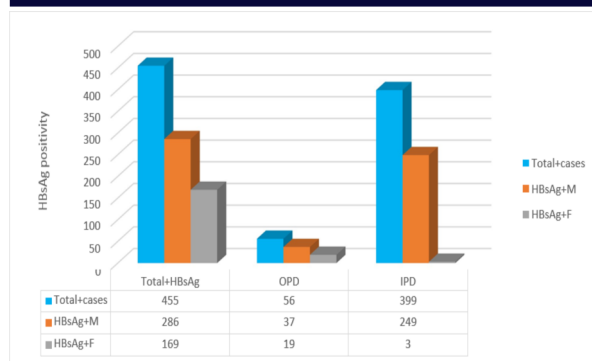


Fig.2. The Graphical Distribution Of The Patients According To Their Registration At The Hospital, Gender And Their Relation With Hepatitis B Infection.

HBsAg reactive patients belonged to IPD (87.70%) as compare to OPD (12.30%). This difference was found to be statistically significant ($\chi^2=68.5433$; $p=0.00001$).

Table.2. shows age and gender wise distribution of the hospital-based population with hepatitis B seropositivity. The seropositivity of HBsAg was 3.37%. The seropositivity for HBsAg among males and females was 2.12 and 1.25 respectively. The difference was found to be statistically significant ($\chi^2=14.2$; $p=0.014$). Majority of

Tab.2. Age and gender distribution of hospital-based population with HBsAg seropositivity.

Age (Year)	Number of males tested n (%)	Number of females tested n (%)	Number of males with HBsAg detected (%)	Number of females with HBsAg detected (%)	Total HBsAg positive cases (%)	χ^2 value	p-value
0-14	488 (8.24)	259 (3.43)	15 (5.24)	3 (1.78)	18 (2.40)	14.2	0.014
15-29	1556 (26.29)	3196 (42.29)	66 (23.08)	44 (26.03)	110 (2.31)		
30-44	1347 (22.76)	2095 (27.72)	45 (15.73)	44 (26.03)	89 (2.58)		
45-59	1224 (20.68)	1178 (15.59)	72 (25.17)	44 (26.03)	116 (4.82)		
60-74	1109 (18.74)	717 (9.49)	80 (27.98)	32 (18.94)	112 (6.13)		
>75	195 (3.29)	112 (1.48)	8 (2.80)	2 (1.19)	10 (3.25)		
Total	5919 (100.00)	7557 (100.00)	286 (4.83)	169 (2.23)	455 (3.37)		

The chi-square statistic is 14.2. The p-value is 0.014. Significant at $p < 0.05$

the HBsAg reactive patients belonged to age group 45-59 years (25.49%) followed by 60- 75 years (24.61%). The low prevalence 2.19% was >75 age group.

DISCUSSION:

In our study the number of total patients were 13476 out of which 5919 (43.92%) were males and 7557 (56.08%) were females. The prevalence of HBsAg was found to be 3.37% (455/13476) which is similar to the study done by Chowdhary A (3-4%),^[6] Khatoon R et al. (3.9%),^[2] Veena Kanodia et al. (4.13%)^[7] but the study done by Sayed A Quadri et al. noted 1.63% prevalence in their hospital based population study,^[8] Tripathi PC et al. have reported the seropositivity rate of HBsAg 1.69% which does not correspond to our study.^[9]

Gender specific prevalence

In our study prevalence of HBsAg was significantly higher in males 4.83% in comparison to females 2.23%. Most of the studies have reported high prevalence of HBsAg in males as compared to females, which is also seen in our study. This finding of higher prevalence in males than females is supported by various earlier studies like Veena Kanodia et al. which showed 4.7% seroprevalence in males and 2.9% in females also the study done by Raminder Sandhu & Gaurav Sharma, showed predominance of males seropositivity which was 5.17% while female was 1.66%.^[10,11]

Age specific prevalence

In present study reveals significant trend of HBV seropositivity with relation to age. The seroprevalence of HBsAg was highest among age groups 45-59 years (25.49%) which resembles to the study done by Lakshmi K et al. in which the prevalence of HBsAg was higher in the age group 40-60 years.^[12] The lowest seroprevalence of HBsAg was among the age group 0-14 years and >75 years.

CONCLUSION:

The possible reason for this higher male preponderance could be from a higher exposure of male to risk factors such as illicit drug use, alcohol use and multiple sexual partners due to their employment away from their home. In addition, as majority of the female patients were homemakers, may have less exposure to various risk factors also may be because of screening of female during pregnancy. In addition, it has been reported that females tend to clear HBsAg from their plasma more efficiently as compared to males.^[2]

Differences in the prevalence of HBV infection in a given population can occur because different ICA based rapid assays used for HBsAg detection in the serum may not have the same accuracy index in every region. Also, in a region, the circulating subtypes of HBV can also be different. In such cases ICA that does not cover this particular subtype will not detect this type when testing. The food and drug administration (FDA) and CE mark for European Union for HBsAg detection are not approved rapid assay. Rapid assays must be used with caution. ICAs need regular validation with an accepted EIA for the detection of HBsAg if rapid ICAs are used for diagnostic and screening purpose in resource poor settings.^[13]

The age of acquiring infection is the major determinant of the incidence & prevalence rates. Safe and effective vaccines are available against hepatitis B virus. People who are elderly, obese, heavy smokers, undergoing hemodialysis or immunocompromised have sub optimal antibody responses when vaccinated. For this reason, the key is to vaccinate the younger population as broadly as possible for maximal prevention.^[11]

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