

SEROPREVALENCE OF HEPATITIS B VIRUS IN PATIENTS ADMITTED TO ERA'S LUCKNOW MEDICAL COLLEGE AND HOSPITAL

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ABSTRACT

Hepatitis-B Virus infections are a serious global and public health problem. To assess the magnitude and dynamics of disease transmission and for its prevention and control, the study of its seroprevalence is important. A medical college catering to the needs of a large population represents an important centre for serological surveys. Available data, on the seroprevalence of these bloodborne pathogens is also very limited. A study was undertaken to estimate the seroprevalence of Hepatitis-B Surface Antigen (HBsAg) in both the sexes and different age groups in a hospital-based population. Serum samples collected over a period of 24 months from patients admitted to various IPDs of Era's Lucknow Medical College and Hospital, Lucknow were subjected within the hospital-based microbiology lab for the detection of HBsAg using ELISA test. The seroprevalence of HBsAg was found to be 1.92%. The study throws light on the magnitude of viral transmission in the community in Lucknow city and provides a reference for future studies.

Key Words: ELISA, Hepatitis B virus, Seroprevalence.

INTRODUCTION

Hepatitis B infection is a serious global and public health problem. Transmission agents for blood-borne viral diseases by Centers for Disease Control are blood, blood products, human tissue, semen, vaginal secretions, saliva from dental procedures, synovial fluid, cerebrospinal fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid. hepatitis B virus (HBV) is highly infectious and can be transmitted covertly by percutaneous routes and overtly by blood transfusion. The HBsAg in serum is the first seromarker to indicate active HBV infection, either acute or chronic.¹ Worldwide over 2 billion people have been infected with HBV and more than 350 million have chronic HBV infection.² India has been placed into the intermediate zone of prevalence of hepatitis B (2-7% prevalence rates by WHO).³ Clinically jaundice occurs in <5 yrs in about <10% cases and ≥ 5 yr in about 30%-50% cases. Acute case-fatality rate accounts to 0.5%-1% cases. Chronic infection occurring in <5 yrs is in 30%-90% cases whereas in ≥ 5 yrs is about 2%-10% cases. Premature mortality from chronic liver disease occurs in 15%-25% cases have been observed.(WHO data). This infection is a leading cause of morbidity and mortality, not only because of the acute illness but also due to its chronic sequelae like chronic hepatitis, cirrhosis, and hepatocellular carcinoma, accounting for more than a million deaths worldwide. (4) An effective vaccine is available for over two decades and has brought about remarkable changes in the global epidemiology of HBV infection. Community-based seroprevalence studies are difficult to conduct in a developing country due to socioeconomic hurdles and logistic difficulties. Understanding and assessing the magnitude and dynamics of

transmission of a disease in a community and for its control and prevention, assessment and study of its prevalence is very important. India has a strong private health care system catering to more than one-half ambulatory and two-thirds outpatient care. (5) As a result, a large amount of clinical information is available in a private health care setting. A private hospital catering to the needs of a large population thus represents an important centre for serological surveys. It was against the above backdrop that the present study was undertaken to estimate the seroprevalence of HBsAg in both sexes and different age groups in a medical college in Lucknow.

MATERIALS AND METHODS

This study was carried out in the Immunology Unit of the Department of Microbiology, Eras Lucknow Medical College and Hospital, Lucknow after an approval from the institutional review committee. Patients taken were admitted to the various IPDs of this medical college and were advised to undergo hepatitis B screening were included in the study.

The study extended over a period of 24 months from March 2010 to February 2012. A 5-ml venous blood sample was collected in a vial from all patients who came with lab requisitions for the testing of HBsAg. The blood was allowed to clot for 45 min at room temperature and the serum was separated after centrifugation at 3000 rpm. The serum sample was then subjected for ELISA test. All the tests were performed in accordance with the manufacturer's instructions with adequate controls .ELISA test was done by **ERBA LISA HEPATITIS B kit 6.**

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RESULTS

In all, 12219 serum samples were processed for HBsAg detection over the 24-month period. Table 1, Table 2 and Table 3 show the age and sex distribution, ward wise distribution and year wise distribution of the hospital-based population with hepatitis B seropositivity, respectively. The seroprevalence of HBsAg was found to be 1.92%. The seroprevalence for HBsAg among males and females was 1.95% and 1.86%, respectively. The highest seroprevalence of HBsAg was found in males between the age of 20 -40 years. The lowest seroprevalence for HBsAg was found in the females of age less than 20 years. There is a marginal increment in the seropositivity of Hepatitis B From year 2010-11 to year 2011-12 in both sexes. In males this is about 0.04% whereas in females it is 0.02%. In females, the highest seroprevalence of HBsAg was found in females medicine ward. The lowest seroprevalence for HBsAg was found in the females ENT ward. Among males the highest seroprevalence was found in Male Medicine Ward, whereas lowest prevalence was found in male ENT ward. Overall the highest seroprevalence was found in Female medicine ward and lowest in female ENT ward. The possible explanation of higher seropositivity in Medicine wards can be because of the fact the most of the patients of liver complaints at first seek medical help from department of medicine, whereas the patients in Surgery and allied surgical specialties can be considered as a true representative of community without any higher risk of seropositivity.

DISCUSSION

The seroprevalence of Hepatitis B Surface Antigen recorded in our hospital-based population was 1.92%. Similar results were obtained by researchers like Nanu A et al (7) (1.92%), Kaur H et al (8) (1.7%), Mohite J B et al (9) (2.11%), Nijhawan S (10) (2.1%) and Singh B (11) (1.77%). Another study conducted in Lucknow by Singh H et al (12) gives 2.06 % seroprevalence of HbsAg.

Studies from Delhi give seroprevalences ranging from 1.77% to 2.6%. These studies include contributions from Singh B et al (11) (1.77%), Nanu A et al (7) (1.92%), Tandon B N (13) (2.14%), Sahni M (14) (2.23%), Panda S K (15) (2.27%) and Irshad M (16) (2.6%). The HBsAg seroprevalence in studies from Chandigarh ranges from 1% to 2.93%. These include contributions from Sharma R R (17) (1.0%), Joshi R M (18) (2.01%), Gupta I (19) (2.48%) and Kaur U (20) (2.93%).

Studies from other parts of India include Ahmad B et al (21) (Jodhpur – 2.43%), Chowdhury A et al (22) (West Bengal – 2.97%), Elavia A J et al (23) (Mumbai – 2.02%), Makroo R N et al (24) (Srinagar – 1.11%), Singhvi A et al (25) (Vellore- 2.84%) and Thakur T S (26) (Himachal Pradesh – 2.59%).

Lodha et al. (2001) in their review article on hepatitis B epidemiology have suggested, the true prevalence rate in India to be 1-2%. (27) There is a wide variation of prevalence in different regions of our country the highest prevalence being reported among the aborigines of Andaman and people of Arunachal Pradesh.

A study conducted in a hospital-based population at Kathmandu Medical College Hospital, Nepal, showed viral hepatitis B prevalence to be 2.5%. (28) whereas HBsAg patients attending a surgical OPD in Rawalpindi, Pakistan, reported a prevalence of 2.28%. (29)

The prevalence of hepatitis B varies from country to country, depending upon behavioural, environmental, and host factors. In general, it is lowest in countries or areas with high standards of living are seen like in Australia, North America, North Europe. Increasing prevalence seen in countries or areas with low socioeconomic levels like India, China, South East Asia, South America. The seroprevalence for HBsAg among males and females was 1.95% and 1.86%, respectively. In a study on hospitalized patients in Manipal, Dutta et al. observed HBsAg positivity of 35.3% in males versus 19.3% in females. (30) No plausible explanation has been given for the higher prevalence in males in the general population but probably females clear the HBV more efficiently as compared to males. (3)

AGE GROUP	MALE	POSITIVE MALE	FEMALE	POSITIVE FEMALE	TOTAL
LESS THAN 20	826	14 (1.69%)	564	8 (1.42%)	22 (1.58%)
20-40	2812	56 (1.99%)	2111	41 (1.94%)	97 (1.97%)
41-60	2755	54 (1.96%)	1421	28 (1.97%)	82 (1.96%)
MORE THAN 60	1313	26 (1.98%)	417	7 (1.68%)	33 (1.91%)
TOTAL	7706	150 (1.95%)	4513	84 (1.86%)	234 (1.92%)

Table 1: Age and Sex Distribution of patients having Seropositivity for Hepatitis B

WARD	MALE	POSITIVE MALE	FEMALE	POSITIVE FEMALE	TOTAL
CASUALTY	2911	54 (1.86%)	1254	22 (1.75%)	76 (1.82%)
MEDICINE	1771	40 (2.26%)	867	20 (2.31%)	60 (2.27%)
PULMONARY MEDICINE	323	7 (2.17%)	64	1 (1.56%)	8 (2.07%)
PAEDIATRICS	164	3 (1.83%)	258	5 (1.94%)	8 (1.90%)
SURGERY	1705	33 (1.94%)	642	10 (1.56%)	43 (1.81%)
ORTHOPADICS	631	10 (1.85%)	313	6 (1.92%)	16 (1.69%)
ENT	201	3 (1.49%)	154	2 (1.30%)	5 (1.41%)
OB & G	NA	NA	961	18 (1.87%)	18 (1.87%)
TOTAL	7706	150 (1.95%)	4513	84 (1.86%)	234 (1.92%)

Table 2: Ward Distribution of patients having Seropositivity for Hepatitis B

TIME DURATION	MALE	POSITIVE MALE	FEMALE	POSITIVE FEMALE	TOTAL
MAR 2010-FEB 2011	3015	58 (1.92%)	2217	41 (1.85%)	99 (1.89%)
MAR 2011-FEB 2012	4691	92 (1.96%)	2296	43 (1.87%)	135 (1.93%)
TOTAL	7706	150 (1.95%)	4513	84 (1.86%)	234 (1.92%)

Table 3: Year wise percentage of results

This is a study defining rates of infection with all these bloodborne agents among the hospital-based population in Lucknow. The observed rates likely reflect the patient population served by our hospital and do not necessarily apply to other centers. However, the study does throw light on the dynamics of viral transmission in the community in this part of the country and provides a good reference for future studies because of the large number of cases investigated.

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