

Original article:

Prevalence of hepatitis B Virus in clinically suspected infectious hepatitis in Meerut, India

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Abstract

Objective:-Hepatitis B is noteworthy medical issues that may include the late continuation of liver cirrhosis and hepatocellular carcinoma. The present study aimed to know the seroprevalence of hepatitis B Virus in Meerut with different clinical conditions. **Methods:** The study conducted on 4927 patients in Meerut, India, which was performed in central research center laboratory of Microbiology at Netaji Subhash Chandra Bose Medical College and Hospital Between January 2013 to April 2017. The sera were separated and screened for HBsAg by immune-chromatographic card test then HBsAg positive serum samples were tested again for HBsAg using ELISA kit. Positive samples for HBsAg were tested for HBeAg ELISA kit. **Results:** In 245 positive cases 118 (48.16 %) were male and 127 (51.84%) were female. The seroprevalence rate of HBV was 4.97% in Meerut, India. Age group 21–30 was the highest seroprevalence (7.46%) when compared to other age group. Of the 245 HBsAg Positive cases 55 (1.12%) were HBeAg positive. 20 were male, Highest HBeAg positive male were found in 21- 30 age group. Out of 55 HBeAg cases, 35 were female and 92 female were negative for HBeAg, this was statistically significant ($P < 0.039$) by using Z test. **Conclusions:** The study uncovered that the seroprevalence of HBV was alarmingly higher in such a populace, which presumably mirrors a high foundation predominance of HBV contaminations ought to be mulled over and Implementation of group based preventive measures and enhanced procedures for safe blood supply may demonstrate valuable to diminish the seroprevalence. **Keywords:** Prevalence; Hepatitis B virus; Hepatitis B surface antigen; Hepatitis B e antigen Meerut

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Introduction

The human hepatitis B virus (HBV) is a small-enveloped DNA virus causing acute and chronic hepatitis. Regardless of the provision of a safe and potent vaccine, HBV infection nevertheless represents a prime global fitness burden, with about 240 million people chronically infected globally and approximately 600,000 deaths occur every year due to HBV-related liver pathologies¹.

The state of affairs in India is nearly 3-four% of the population infected by means of HBV, and chronic hepatitis B (CHB) constituting greater than 50% of the chronic hepatitis instances. This, inside the context of a huge populace and shortage of a national immunization program might spell off a projected growing burden of infection and liver illnesses because of HBV in this nation. In this mindset, the HBV epidemiology in India has turned out to be relevant

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because of the opportunity that India may additionally soon have the most crucial HBV-infection (HBVI) pool inside the global². In India, the occurrence of chronic-HBVI in pregnant females is 0.82% and in the course of being pregnant, HBVI offers the chance of mom-to-infant (vertical) transmission³.

Many epidemiological and molecular research have shown that chronic HBV infection (CHBVI) represents the main chance factor for hepatocellular carcinoma development⁴. Approx 5 percent in adults & 90 percent in new-born observed chronicity. Although HBV does no longer induce direct cytopathic consequences beneath normal infection conditions⁵ liver damage (fibrosis, cirrhosis, and sooner or later hepatocellular carcinoma) is thought to be triggered by means of the continuing immune reaction and a consistent liver cirrhosis⁶. After getting into the blood, the virus infects hepatocytes, and viral antigens are displayed on the surface of the cells. Cytotoxic-T-cells mediate an immune attack against the viral antigens, and initiate liver cirrhosis. Immune assault against viral antigens on inflamed hepatocytes is mediated by way of cytotoxic T cells. The pathogenesis of hepatitis B is probably the end result of this cellular-mediated immune damage, due to the fact HBV itself does now not purpose a cytopathic effect. Antigen-antibody complexes motive a number of the early signs (e.g. arthralgias, arthritis, and urticaria) and a number of the complications in CHB (e.g. glomerulonephritis, cryoglobulinemia, and vasculitis)⁷.

HBV is the prototype member of family Hepadnaviridae, which are the smallest DNA-containing, enveloped animal viruses regarded. Feature of HBV is its high tissue- and species-specificity, in addition to a unique genomic-regime with uneven mechanism of replication⁸. Seeing that all hepadnaviruses use a reverse-transcriptase to copy their genome, they are considered distantly associated with retroviruses. no matter a long time of studies and extensive development in information the molecular virology of HBV, essential steps of the infection have not but been clarified⁹ best these days the invention of the cellular receptor and the establishment of modern infection models and molecular techniques have spread out new opportunities to investigate particular steps of the lifecycle as well as the organisation and activity of the covalently closed circular DNA (cccDNA), the viral minichromosome that serves because the template of HBV transcription within the nucleus of the inflamed hepatocytes, permitting conservation of CHBVI^{10,11}.

HBV is present in blood, secretion from mouth as saliva, head of sperm in semen, secretions from

vagina and menstrual blood secretes during bleeding phase of menstrual cycle of infected individuals and without difficulty transmitted via contact with infected body fluids¹². Perinatal vertical transmission is the maximum common mode of transmission globally¹³. In households of a chronically infected individual, HBV infection can arise thru man or woman-to-man or woman, nonsexual contact¹⁴. The neonates born to moms infected with CHB, have ninety percent chances of attaining CHBVI and its persistence¹³. In contrast, while HBV is received in the course of adulthood, simplest 5-10-percent of adults progress persistent CHBVI¹⁴. Most of the developed countries screen all pregnant ladies for HBVI, however, within the developing countries it depends upon the risk factors. In India, there is no consistent coverage of screening the pregnant women across the country. A meta-analysis of incidence of hepatitis B in India showed 2.4-percent incidence in general population.

The purpose of present have a look at become to assess seroprevalence of HBV in Meerut and the presence of HBsAg and HBeAg In clinically suspected infectious hepatitis sufferers as the HBV is increasing in India.

Materials and methods

Study background and subjects

This become conducted on 4927 sufferers. Blood sample were collected in sterile, small tube from suspected HBVI and its sequelae patients from Meerut and prosses in central research station laboratory of Microbiology at Netaji Subhash Chandra Bose Subharti Medical College and Hospital between January 2013 to April 2017.

INCLUSION CRITERIA: Age between 21 – sixty five years with suspected HBV infections and its sequelae patients. Ability to offer written informed consent indicating consciousness of the investigational nature of this this study.

Exclusion criteria: if they have been obtained any Immunization for HBV Co-infection:- HBV – HCV, HBV- HIV, HBV – HDV , Liver disorder due to other viruses, Alcohols, Diabetics, Autoimmune ailment , Immunomodulatory drugs (which includes systemic steroids, interferons, interleukins, or different cytokines)

Sample collection and processing

10 milliliter blood samples obtained in the Serology section of department of Microbiology from patients suspected of acute infectious hepatitis have been analyzed. The sera have been separated and screened for HBsAg by way of Hepa Card (J. Mitra & Co. Pvt. Ltd. New Delhi, India) and advantageous serum become stored in frozen (-20 °C) till tested for the viral

markers. The Positive serum samples for HBsAg by using Hepa Card were tested once more for HBsAg the use of commercially available ELISA kit (ERBA Transasia Bio-medicals Ltd. Daman, India). Serum samples tested Positive for HBsAg were tested for HBeAg (ELISA; Beijing Kewei clinical Diagnostic Reagent Inc. Beijing, China).

Statistical evaluation

Received information had been analyzed via the usage of the SPSS software program for home windows version 16. The assessment of facts in appreciate of age groups and gender had been accomplished by way of Z- test. $P < 0.05$ became consider to be statistically significant.

Ethical approval

Ethical approval for the study was taken from institutional research ethical committee.

Results

Of the 4927 serum sample, 2218 (45.01%) male and 2709 (54.98%) female (figure 1) were tested for HBsAg with the age range 21 – 65. [Table 1] In this study, it was observed that 245 were positive and 4682 were negative. In 245 positive cases 118 were male and 127 were female. In 4682 negative cases 2100 were male and 2582 were female. Highest positive case were found in the age group of 21- 30. [Table 2] The seroprevalence of total case was 4.97%. Seroprevalence of total female was 4.69% and theseroprevalence of total male was 5.32% .Age group21–30 was the highest seroprevalence (7.46%) when compaired to other age group.Thehighest seroprevalence of male found in the age group21–30 was 6.88 and the highest seroprevalence offemale found in the age group 21–30 was 8.1.[Table 3]

Of the 245 HBsAg Positive case 55 were HBeAg positive and the prevalence of HBeAg positive was 1.12% . 20 male were positive for HBeAg and 98 male were negative for HBeAg and the prevalence of HBeAg positive male is 36.36 %. Highest HBeAg positive male were found in the age group of 21- 30. Out of 55 HBeAg casees, 35 were female and 92 female were negative for HBeAg, this was stastically significant ($P < 0.039$) by using Z test and the prevalence of HBeAg positive female is 63.64 %. Age group21–30 was the highest seroprevalence (49.09%) when compaired to other age group. [Table 4]

Discussion

Occurrence of hepatitis B varies from country-country and depends upon a complicated interaction of behavioral, environmental and host factors. in standard, it is lowest in international locations or vicinity with high standard of residing (eg: america,

North america, Europe) and maximum in countries or areas in which socio monetary stage is lower (China, south east Asia, south America) The scenario in India is sort of 3-4% of the population infected by way of HBV, and CHB constituting greater than 50% of the chronic-cases. This, inside the context of a large populace and absence of a countrywide immunization program could spell off a projected increasing burden of infection and liver diseases due to HBV on this country. In this perspective, the HBV epidemiology in India has grow to be relevant because of the opportunity that India may additionally quickly have the most important HBVI pool inside the global¹⁵.The prevailing observe shows 4.97% seroprevalence of HBsAg among Clinically Suspected Infectious Hepatitis patients that's similar to studies conducted with the aid of Monika Rajani et al (4%) ¹⁶.The frequency of sreopositivity was determined to be better than that said in other studied performed by means of P. A. Bart et al (9.5%)¹⁷. and the seroprevalence of HBsAg became located to be decrease than that reported in different studied conducted by B.R. Tiwari et al (1.2)¹⁸. Variable effects became found 1.55%, 1.43%, 1.09%¹⁸⁻²⁰ in deferent research in India.

Conclusions

The study showed that occurrence of HBV turn out to be higher so unique intervention applications need to be bear in mind to aware the majority about the incredibly infectious nature of HBV and its mode of transmission. Several studies on HBVI, its sequelae, and the various approach of prevention were posted in the past 3 decades. But even the latest research have discovered areas of poor or even erroneous knowledge on HBVI. Social stigma can end result from terrible statistics on HBVI, as is the case in Mainland India.The observe found out that the hassle of HBV was maximum in males. The HBV seroprevalence was higher in age group 21- 30.

Conflict of interest statement

We declare that we have no conflict of interest.

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Authors' Contribution:

Data gathering and idea owner of this study:

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Study design: Salman Khan, Molly Madan, Sunil Kumar Virmani

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Editing and approval of final draft: Salman Khan, Molly Madan

Table 1:- Sex and Age distribution among patients

Age group (Years)	Male No.(%)	Female No.(%)	Total No.(%)
21 - 30	1003(45.22)	914(33.74)	1917(38.91)
31 – 40	637(28.72)	773(28.53)	1410(28.62)
41 - 50	374(16.86)	665(24.55)	1039(21.09)
51 - 65	204(9.2)	357(13.18)	561(11.39)
Total	2218	2709	4927

Table 2:- Sex and Age distribution among HBsAg positive patients

Age group (Years)	Male	Female	Total
21 - 30	69	74	143 (58.37%)
31 – 40	33	29	62(25.31%)
41 - 50	11	15	26(10.61%)
51 - 65	5	09	14 (5.71%)
Total	118 (48.16 %)	127 (51.84%)	245 (4.97%)

Table 3 :- Prevalence of HBV in Male & female at different age group

Age group (Years)	Male	Female	Total
21 - 30	6.88	8.1	7.46
31 – 40	5.18	3.75	4.40
41 - 50	2.94	2.26	2.50
51 - 65	2.45	2.52	2.50
Total	5.32	4.69	4.97

Table 4:-Distribution of HBeAg in Male and Female among HBsAg +Ve at different age group

Age group (Years)	Male	Female	Total
21 - 30	8	19	27 (49.09%)
31 – 40	7	13	20 (36.36%)
41 - 50	4	3	07 (12.73%)
51 - 65	1	-	1 (1.81%)
Total	20 (36.36 %)	35 (63.64%)	55 (1.12%)

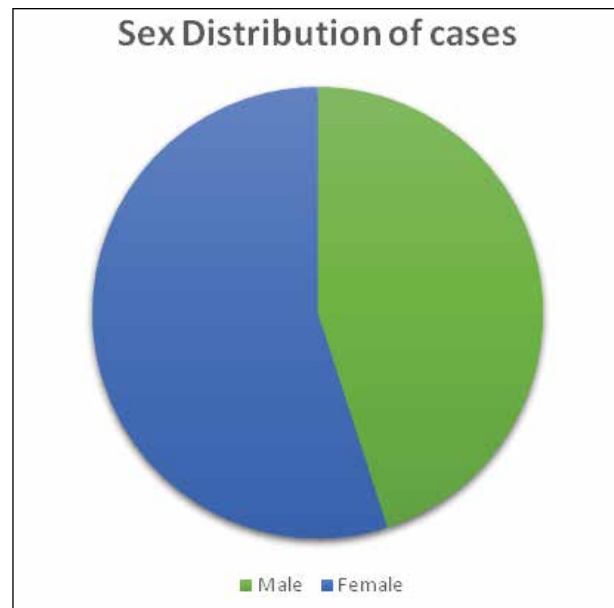


Figure 1:- Gender Distribution of Total Cases

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