



STUDY OF SEROPREVALENCE OF HEPATITIS B VIRUS INFECTION.

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Article Info: Received 20 November 2020; Accepted 25 December. 2020

DOI: <https://doi.org/10.32553/jbpr.v10i1.824>

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Conflict of interest statement: No conflict of interest

Abstract:

Introduction: HBV is a DNA virus belonging to family Hepadnaviridae. HBV infection leads to a wide spectrum of liver diseases ranging from acute to chronic hepatitis, cirrhosis & hepatocellular carcinoma. HBV is known to be the 10th leading cause of death. WHO estimates that worldwide more than 2 billion people have been infected with HBV. India accounts for a very large proportion of the HBV burden.

Aim and objectives: To study the seroprevalence of Hepatitis B virus infection among patients attending our hospital, to know the prevalence among different age groups and among different genders

Material and Methods: This is a retrospective, cross-sectional study carried out at Dept. of Microbiology, SHKM Govt. Medical College and hospital, Nalhar, Nuh, Haryana for the duration of 6 months (April 2019 to September 2019). A total of 9000 serum samples collected from patients attending outpatient departments, indoor patients and Intensive care unit of SHKM hospital.

Results: It was seen that out of 9000 patients, 432 patients were positive for HBsAg with the prevalence rate 4.8%. The prevalence was higher in females (5.58%) as compared to males (4.19%). The frequency of HBV among age group 1-14, 15-40 and > 40 years was 8.4% (36), 48.3% (209) and 43.3% (187) respectively.

Conclusion: Our study highlights HBV infection rate in this part of Haryana and shall provide reference to future studies on the epidemiology of HBV infection. It helps us to understand and assess the magnitude of disease in the community.

Keywords: Seroprevalence, Hepatitis B, Haryana

Introduction

Hepatitis is the term given to inflammation of liver, that is mostly caused by viral infection but it can also be due to toxic agents or other diseases like autoimmune and metabolic disease. The causative agent of viral hepatitis type B is the hepatitis B virus (HBV). Hepatitis B virus is a DNA virus which belongs to family Hepadnaviridae. The virus by replicating in hepatocytes, interferes with the normal functioning of the liver. The immune system, in response to combat and potentially eliminate the virus, results in pathological damage

and liver inflammation. Hepatitis B Virus infection leads to wide spectrum of liver diseases ranging from acute to chronic hepatitis, cirrhosis and hepatocellular carcinoma.^[1,2,3,4]

The virus is transmitted from infected mother to child, via contact with blood and other body fluids, unprotected sexual contact, use of injectable drugs with sharing of needles, syringes or drug preparation equipment and accidental needle prick injuries in health care workers.^[1,4,5] Being variable in its course, the different clinical manifestations of HBV are influenced by the infected person's age as well as the immune status.^[4]

According to WHO estimates of 2015, around 257 million people were living with chronic hepatitis B infection. During this period, hepatitis B resulted in approximately 8,87,000 deaths, mostly from cirrhosis and hepatocellular carcinoma.^[1]

India accounts for a very large proportion of the HBV burden. The prevalence of HBsAg in India is 3 to 4.2% and over 40 million are HBV carriers. Over 1,15,000 Indians die due to Hepatitis B related complications every year.^[6,7]

In general population the seroprevalence of Hepatitis B can be determined by detecting the presence of Hepatitis B surface antigen. For controlling and managing the infection the seroprevalence estimation is important to health planners.^[8]

Therefore, present study was conducted to estimate the seroprevalence of HBV infection and to know the prevalence among different age group and different gender in hospital-based population at SHKM GMC hospital, Nalhar, Nuh (Haryana).

Material & Methods:

This is a retrospective, cross-sectional study carried out in Microbiology laboratory of SHKM Govt. Medical College and hospital, Nalhar, Nuh, Haryana for the duration of 6 months (April 2019 to September 2019). A total of 9000 blood samples were collected from patients attending outpatient departments, indoor patients and Intensive care unit. Five ml of venous blood was collected from patients and serum was separated. The serum was screened for presence of Hepatitis B surface antigen (HBsAg) either by ELISA kit (Merilisa HBsAg manufactured by Meril Diagnostics Pvt. Ltd.) or by Rapid diagnostic test kit (ASPEN manufactured by Aspen Laboratories Pvt. Ltd.). ELISA was used for testing outdoor patients. Rapid card tests were used for indoor patients. All the tests were performed in accordance with Manufactures' instructions with appropriate controls. Detailed information including demographic details like age, gender etc. was also recorded.

Results:

Serum samples of 9000 patients were tested for HBsAg over a period of six months. Out of 9000 patients, 432 patients were positive for HBsAg with the prevalence rate 4.8% as shown in Figure 1. Age wise distribution of HBsAg positivity reveals a high prevalence 48.3% among 15-40 years followed

by 43.3% in >40 years age as shown in Figure 2. Out of 9000 patients 5080 (56.4%) were males and 3920 (43.6%) were females. The prevalence was higher in females (5.58%) compared to males (4.19%) as shown in Table 1.

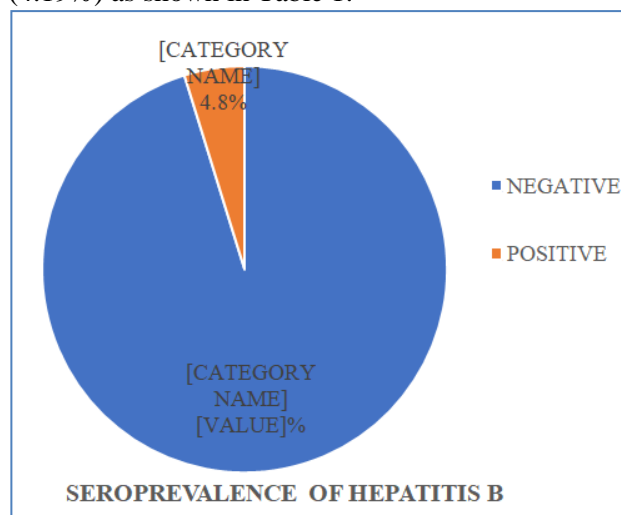


Figure 1: Seroprevalence of Hepatitis B

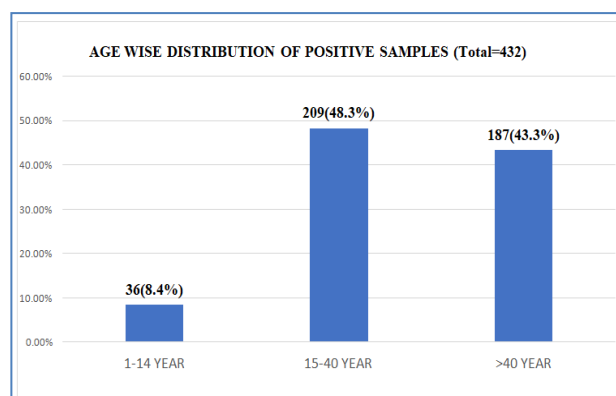


Figure 2: Age Wise Distribution of Seroprevalence

Table 1: Gender Wise Distribution of Samples

GENDER	MALE	FEMALE	TOTAL
POSITIVE	213 (4.19%)	219 (5.58%)	432 (4.8%)
NEGATIVE	4867 (95.81%)	3701 (94.42%)	8568 (95.2%)
TOTAL	5080 (100%)	3920 (100%)	9000 (100%)

Discussion:

The seroprevalence of HBsAg in the present study was found out to be 4.8%. The findings are similar to the prevalence reported by WHO in their fact sheet for India, 2016^[6] wherein they reported prevalence of Hepatitis B to be in the range of 3%-4.2%, and to various other studies such as, HBV prevalence in the hospital based population at Jaipur, Rajasthan in a tertiary care hospital by

Kanodia V et al 2015,^[8] the seroprevalence of HBsAg was found to be 4.13%. In a study conducted by Khatoon R, Jahan N 2016 at Lucknow, U.P. the seroprevalence was 3.9%.^[9] Rukadikar A et al 2015 reported the prevalence to be 4.79% in a tertiary care hospital at Bhopal, M.P.^[10] Another hospital-based population study by Sharma M et al 2017 at Udaipur, Rajasthan found the prevalence HBV to be 2.31% among OPD patients.^[13] Lower prevalence rates were found in studies such as, a study by Vazhavandal G et al 2014 in their hospital-based study at Tamil Nadu, found prevalence rate of only 1.61 %.^[11] Similarly, a low prevalence rate of 1.2% was found by Naqshbandi I et al 2016 in their Community based study at Srinagar, Kashmir.^[12] Higher prevalence rates were also observed in studies such as, a study by Sharma R et al 2019 in their community-based study at Spiti, Himachal Pradesh found HBV seroprevalence of 10.6%.^[14] Sheikh N et al 2008 in their study at Baluchistan, Pakistan found seroprevalence of HBV to be 9.8%.^[15] Even Higher seroprevalence of 21.16% was reported by Gebreegziabher D et al 2015 at Sekota, Ethiopia in their hospital population-based study.^[16]

Sex Specific Prevalence:

Seroprevalence of HBV among males and females in our study was 4.19% and 5.58% respectively. The seroprevalence rate was higher in females as compared to males in the region similar findings were reported by Sharma R et al 2019 in their community-based study at Spiti, Himachal Pradesh where they found 11% females and 10.2% males to be HBsAg reactive.^[14] Majority of studies found prevalence higher in males as compared to females such as studies by, Kanodia V et al 2015 Jaipur, Rajasthan^[8]; Khatoon R, Jahan N 2016 at Lucknow, U.P.^[9]; Naqshbandi I et al 2016 Srinagar, Kashmir^[12] and Sharma M et al 2017 at Udaipur, Rajasthan.^[13]

Age Specific Prevalence:

In our study the frequency of HBV seroprevalence among age groups 0-14, 15-40, >40 years was 8.4%, 48.3%, 43.3% respectively. Among the positive cases, majority were in the age group 15-40 years. Higher prevalence among 15-40 years in India and other countries in Asia pacific region may be due to higher exposure to occupational risk factors as well as high risk behaviors among young individuals.^[8] The seroprevalence in 1-14 years age group was lowest which can be attributed to the

effect of Universal Immunization Programme. Similar difference among age groups was found in other studies such as, a study by Kanodia V et al 2015 Jaipur, Rajasthan where they found seroprevalence among age groups 0-20 and 21-40 years as 9.21% and 40.39% respectively.^[8] In another study by Vazhavandal G et al 2014 at Tamil Nadu the prevalence of HBV among age groups 0-20 and 21-40 was 5.07% and 45.07% respectively which was also similar to our study.^[11]

Conclusion:

This study highlights HBV infection rate in the southern Haryana and shall provide reference to future studies on the epidemiology of HBV infection.

Limitations of the Study

The present study has not evaluated the other diagnostic markers of hepatitis B and not performed molecular confirmation due to resource constraints.

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