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A study on Hepatitis B and its Seroprevalance in Blood Bank

Dr. Nandakishore

[1]Assistant Professor, Department of Pathology, Pinnamaneni Siddhartha Medical College, Vijayawada, A.P.

Abstract

Background: Globally, Hepatitis B is one of the commonest chronic infections. It has a major public health problem, especially in developing countries. It is evident that approximately 30% of the world's population having either current or past infection with hepatitis B virus. Subjects and **Methods:** Blood sample was collected at the time of collection of blood from donor tubes of blood bag. 2 ml blood was kept for testing hepatitis B. Rapid card was used for the screening of donor blood for Hepatitis B. All reactive samples were tested again using the same ELISA kit. **Results:** We suggested that seroprevalence of Hepatitis B in this study was 0.40% among all donors. **Conclusion:** This study conclude that, it is essential to impart accurate education about immunization to the population at risk in particular and general masses as well.

Keywords: Hepatitis B, Seroprevalance.

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INTRODUCTION

Hepatitis is an inflammation of the liver. Viral infection is the main cause of hepatitis. A, B, C, D and E are the five types of hepatitis viruses. These viruses are not only responsible for the illness and deaths but also for outbreaks and epidemic spread. Hepatitis B and C are majorly associated with chronic diseases in millions of people and also the major cause of liver cirrhosis and cancer.

Hepatitis B virus (HBV) is a small enveloped, double stranded DNA containing virus. It causes persistent noncytopathic infections of the liver. Viral specific particles are constantly secreted by the infected hepatocyte that accumulates to high level (1013/ml) in the blood.[1] It belongs to the family Hepadnaviridae. The length of HBV is 42 nm and composed of 27 nm nucleocapsid core that is surrounded by an outer lipoprotein coat containing the Hepatitis B surface antigen (HBsAg). The virus interferes with the liver function while replicating in the cytoplasm of hepatocytes.[2] There are three principal antigens of HBV- HBV surface antigen (HBsAg), HBV core antigen (HBcAg) and HBVe antigen (HBeAg). HBV surface antigen (HBsAg) is present on the surface also circulates in plasma. In all cases of acute and chronic HBV, HBsAg is detectable in serum. HBV core antigen (HBcAg) compromises the middle portion (nucleocapsid) of virus. During viral replication, this antigen is found only in hepatocyte. HBVe antigen (HBeAg) is another gene product that produces HBeAg. Active viral replication indicates its existence in serum. Circulating antibody against the viral antigens develop in response to infection.[3]

Blood transfusion service (BTS) is an essential part of the healthcare system. To ensure safety, adequacy, accessibility, and efficiency of blood supply at all levels are the prime objective of BTS (Islam, 2009). It is well known that blood transfusion is related with a number of complications. Some are only minor and others are possibly life threatening, demanding for meticulous pre-transfusion testing and screening. Without testing and screening blood transfusion possesses the patient at risk of acquiring many transfusion transmitted infections like Hepatitis B, Hepatitis C and HIV.[4]

Globally, Hepatitis B is one of the commonest chronic infections. It has a major public health problem, especially in developing countries. It is evident that approximately 30% of the world's population having either current or past infection with hepatitis B virus1. According to WHO guidelines, countries are classified on the basis of endemicity of hepatitis B virus (HBV) i.e. high (8% or more), intermediate (2- 7%) or low (<2%) incidence countries.[5] Though western developed nations have low prevalence of hepatitis B (<1%),2 but countries like Southeast Asia, China and Africa, have high prevalence of chronic Hepatitis B (10%).[6] India comes under the intermediate to high endemicity category.

This study conducted in the Department of pathology in a tertiary care centre.

METHODS

Study Area:- This study conducted in the Department of pathology in a tertiary care centre.

Study Population:- 1220 total number of cases was involved in this study. Among all these cases 14 were female and 1206

Address for correspondence*

Dr. Ramesh Babu

Assistant Professor,
Department of Surgery,
Chalmeda Anand Rao Medical College,
Karimnagar, Telangana

were males.

Study Duration:- The duration of the study over a period of one year.

Data collection:- 5 ml blood sample was collected at the time of collection of blood from donor tubes of blood bag. 2 ml blood was kept for testing hepatitis B. Rapid card was used for the screening of donor blood for Hepatitis B. All reactive samples were tested again using the same ELISA kit. Samples which were positive on both tests were considered Hepatitis B positive and were included for calculation of seroprevalence.

Data Analysis:- Data were analyzed by using Microsoft Excel.

RESULTS

In the present study, males (98.8%) were predominant followed by females (1.2%). We suggested that seroprevalence of Hepatitis B in this study was 0.40%. Among the all donors 2 case positive in 26-35 age group followed by other age group. Most of the cases belong to a middle class group rather than low class.

Table 1: Distribution of cases according to gender.

Gender	Number of cases	Percentage
Male	1206	98.8%
Female	14	1.2%
Total	1220	100%

Table 2: Seroprevalence of HBsAg of cases according to Age.

Age	Number of cases	Percentage	HBsAg Positive	Percentage
18-25	212	17.3%	1	0.47%
26-35	511	41.8%	2	0.39%
36-45	258	21.2%	1	0.38%
>45	239	19.5%	1	0.41%
Total	1220	100%	5	0.40%

Table 3: Distribution of cases according to socioeconomic status.

Socioeconomic status	Number of cases	Percentage
Middle	1101	90.2%
Low	119	9.8%
Total	1220	100%

DISCUSSION

The occurrence of HBsAg (Hep B infection) differs from place to place. The present was conducted in the in a tertiary care centre. Among the 1220 blood donors screened, the seroprevalence of HBsAg was observed to be 0.40% in this study. According to the WHO classification, this region comes under a low prevalence area (<2%). This could be due to several factors. Firstly, in our study 85% of blood donors were literate. They are very much aware about the disease and modes of prevention. It may be one reason for the low prevalence in HBV infection. Secondly, the implementation of pre-donation counselling and donor selection criteria also help to exclude the possibly infected donors.

The present study shows the low prevalence of hepatitis B infection in this in a tertiary care centre compared to other parts of India. Gupta et al and Prakash Zacharias et al have also shown low seroprevalence of HBsAg in blood donors.[7,8] In this region of India, the seroprevalence of HBV infection could have been better studied in the non-pre-screened samples. There are much chances of missing occult HBV infection because some hepatitis B patients have absent HBsAg. It was identified by doing anti HBc.[9,10] These are the possible limitations of our study.

Though, all the seropositive donors in the present study were male but this majority among males was not statistically significant. Other studies also reported a significantly higher HBsAg seroprevalence in males.[11,12] In this study the majority of seropositive donors were younger than 35 years. Naila Kayani et al also observed the similar results.6 In contrast Rodenas et al and Patil AV et al found the higher prevalence of HBsAg in donors older than 38 years.[13,14]

In this study, 2 of 5 HBsAg positive donors belonged to low socioeconomic status and 3 were from middle class. This prevalence of seropositivity among low socioeconomic groups was statistically significant. Similar results were found by Nandi J et al. Poor hygienic status and lack of awareness about Hepatitis B infection and its spread are the main reasons behind this higher prevalence of hepatitis B in lower socioeconomic groups. The results of the present study show that the one of the few regions from India where seroprevalence of HBsAg is low. Higher prevalence of Hepatitis B has been shown by low socioeconomic groups and male donors.

CONCLUSION

The study emphasizes on the importance of providing education about Hepatitis B infection and its spread. It is also essential to impart accurate education about immunization to the population at risk in particular and general masses as well.

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