

Original article:

Comparative study on Prevalence of Hepatitis B surface antigen among blood donors and In patient hospital attendees at a tertiary care hospital, Hyderabad.

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Abstract

Introduction: Viral Hepatitis is a major public health problem in India. Surveys for screening HBsAg have been primary, simple and the most useful mode of determining HBV infection rates. The study has been designed with an objective to assess the prevalence of HBsAg in blood donors and hospital inpatient attendees .

Material & Methods: The study was conducted in tertiary care hospital, Hyderabad. The study population included all the blood donors donating blood in the blood bank of the hospital and inpatient hospital attendees in the study period of 6 months from February 2015 to July 2015. Standard procedures were used during the blood collection. A total of 2,500 donor blood samples & 500 hospital inpatient attendees were screened by Central Drugs Standard Control Organization (CDSCO) approved enzyme linked immuno-sorbent assay (ELISA) kit Hepalisa.

Results: Seropositivity was more among inpatient hospital attendees (4.4%) compared to blood donors (1.2%) which was found to be statistically significant ($p < 0.0001$). Majority (93.3%) were males and half the proportion (53%) belonged to 31-35 years age group. In comparison with voluntary donors, Seropositivity was more among replacement donors.

Conclusions: A higher rate of prevalence of HBsAg positivity was observed among inpatient hospital attendees compared to blood donors 4.4%&1.2% & respectively .

Key words: Blood donors, Hepatitis B surface antigen, inpatient hospital attendees , Prevalence, Seropositivity

Introduction:

Viral Hepatitis is a major public health problem in India¹. Viral hepatitis can be acute, sub acute or chronic and the viruses responsible are Hepatitis A (HAV), Hepatitis B(HBV), Hepatitis C(HCV), Hepatitis D(HDV) and Hepatitis E(HEV). Hepatitis B virus infection (HBV) is global public health problem. Nearly Two billion people globally have been infected with HBV, 350 to 400 million people are chronically infected with HBV^{2,3,4} and tens of millions of new cases occur annually. At least 15-20% of chronically HBV infected will die due to liver disease caused by HBV and this constitutes nearly one million people each year. It is the most common cause for chronic liver disease

including cirrhosis of the liver and hepatocellular carcinoma worldwide.

Prevalence of HBV infection varies greatly in different parts of the world.

The World Health Organization (WHO) has classified HBV prevalence into high endemicity (>8%), intermediate (2-7%) and low endemicity (<2%)⁵. HBV prevalence in India is in intermediate range.

Every year 100,000 Indians die due to HBV infection related illnesses. Surveys for screening HBsAg have been primary, simple and the most useful mode of determining HBV infection rates. HBV transmission can occur Parenterally, Sexually or perinatally.

Certain population have been recognized who are at a greater risk of acquiring HBV infection. These include those requiring multiple transfusions, haemodialysis, renal transplant recipients, hospital staff, drug abusers, homosexuals and the immune compromised.

Since there is no intermediate host identified till now for HBV these People are high risk population and acts as carrier and transmit infection to general population^{6, 7}. The epidemiological studies are extremely useful in identifying the HBV in the general and high risk personals to take measures for the prevention of HBV infection.

Blood transfusion service (BTS) is an integral and indispensable part of the healthcare system. The priority objective of BTS is to ensure safety, adequacy, accessibility, and efficiency of blood supply at all levels Transfusion associated hepatitis B viral infection (TAHBV) continues to be a major problem in India even after adoption of mandatory screening of hepatitis B surface antigen (HBsAg) by ELISA. The high incidence of TAHBV is reported in patients receiving multiple blood transfusions. A constant monitoring is required to determine the safety and prevention of infection⁸.

A tertiary teaching Hospital patient based study is helpful in assessing true nature of problem in the community. Prevalence studies help in assessing the magnitude of HBV infection and aid in devising preventive measures. This study was undertaken to estimate the burden of HBV infection among blood donors & hospital inpatient attendees in a tertiary care hospital.

Material & Methods:

Study setting:

A tertiary care super specialty hospital with bed strength of more than 1000 was chosen for study by simple random technique. The hospital has been recognized as a referral centre by CGHS Central government health scheme and most other private

Organizations. Hence there is a good opportunity to screen for HBsAg in blood donors attending the hospital. Institutional Ethical committee permission was obtained.

Study population:

The study population included all the blood donors donating blood in the blood bank of the hospital and In patient hospital attendees who form the replacement donors

Study period: 6 months from February 2015 to July 2015.

Method of collection:

A routine general examination was done for all the individuals coming for the blood donation and hospital inpatient attendees. Blood pressure, height & weight were measured. Haemoglobin estimation was done.

Persons belonging to certain risk groups like patients from thalassemia, dialysis patients, pregnant women were excluded from the study.

Informed written consent was taken from them study participants after explaining about the purpose and objective of the study. A pre designed questionnaire was used to collect information related to socio demographic profile. They were also asked about previous surgical procedures, history of past or current use of intra venous drugs, etc. The test results were kept confidential.

Standard procedures were used during the blood collection. A total of 2,500 donor blood samples & 500 hospital inpatient attendees were screened by CDSCO approved ELISA kit Hepalisa (J Mitra & Co Pvt. Ltd. India) and Hepanostika HBsAg Ultra.

Data analysis:

Data entry was done using Microsoft Excel 2007 version and analysed using Epi info version 7. Frequency tables and graphs were used to represent data. Data is summarized in percentages. Univariate analysis was used with Chi-square test

and significance level at 5% is used to determine the association of various independent factors.

Results:

A total of 2,500 blood donor samples and 500 hospital inpatient attendees were screened during the study period. Majority were males (86%) and belonged to 26-30 years age group (43.5%).

Prevalence of HBsAg:

Out of the total 2,500 samples studied, 30 of them were found to be positive for HBsAg. The prevalence rate was 1.2%. Out of the total 500 hospital inpatient attendees, 22 of them were found to be positive for HBsAg. The prevalence rate was 4.4%.

Table No 1: Prevalence of HBsAg among blood donors & hospital inpatient attendees

Result	HBsAg	
	Blood donors	Hospital inpatient attendees
	No (%)	No (%)
Positive	30 (1.2%)	22 (4.4%)
Negative	2470 (98.8%)	478 (95.6%)
Total	2500 (100%)	500 (100%)

The overall prevalence of Seropositivity was more among hospital inpatient attendees when compared to blood donors which was found to be statistically significant (chi square 25.05, df=1, p <0.0001).

Table No 2: Characteristics of HBsAg positive cases among blood donors (n=30) & hospital inpatient attendees (n=22)

Characteristics	Blood Donors	Hospital inpatient attendees
	No (%)	No (%)
Sex		
Male	28 (93.3%)	19 (86.4%)
Female	02 (6.7%)	04 (1.4%)
Age		
21-25	01 (3.3%)	02 (9.1%)
26-30	02 (6.7%)	05 (22.7%)
31-35	16 (53.3%)	10 (45.5%)
36-40	06 (20%)	04 (18.2%)
41-45	05 (16.7%)	01 (4.5%)
Occupation		
Labourers	07(23.3%)	03 (13.7%)
Business	15(50%)	06 (27.3%)
Other	08(26.7%)	13 (59%)

Demographic characteristics of the HBsAg positive blood donors found that majority (93.3%) were males and half the proportion (53%) belonged to 31-35 years age group. Occupation wise revealed that majority (50%)

were from business. In comparison with voluntary donors, seropositivity was more among replacement donors (blood donated to replace blood utilized which includes relatives or friends of patients).

Vaccination Status Immunization status among the two groups found that blood donor group were better immunized than hospital inpatient attendee which was found to be statistically significant. ($p < 0.05$).

Table No 3: Immunization status against HBsAg among study population

Group	Immunization status		Total
	Immunized	Not Immunized	
Blood donor group	312	2188	2500
Hospital inpatient attendees	39	461	500

Chi square=8.8, df=1, p value=0.002

Discussion:

The discovery of HBsAg was a major breakthrough in decreasing the incidence of post transfusion hepatitis. According to India's Drugs and Cosmetics Act (1945), each blood unit has to be tested for hepatitis B virus infection. Present study which has been designed with an objective to assess the prevalence of HBsAg in blood donors and hospital inpatient attendees found that prevalence was 1.2% & 4.4% respectively showing a higher prevalence in hospital inpatient attendees.

A hospital based study by Yashovardhan et al in Andhra Pradesh observed that the overall prevalence of Hepatitis B sero positivity was 2.2%. No statistical difference was observed between male & females and sero positivity was more among voluntary blood donors compared to replacement donors in contrast to the findings of the present study⁹.

A similar kind of study by Deepti Sachan et al in Chennai found that prevalence of HBsAg positivity was similar in both blood bank donors and hospital inpatient attendees¹⁰. This finding is in contrast to the present study in which prevalence of seropositivity was more among hospital inpatient attendees when compared to blood donors which was found to be statistically significant ($p < 0.0001$).

Seropositivity was found to be 3.5% among 200 blood donors in a study by Lavanya et al in Tamil Nadu.¹¹

Another study by Karandeep Singh et al on trends of seroprevalence of Hepatitis B virus infection among blood donors of coastal Karnataka revealed a very low prevalence (0.62%) with a decreasing trend over three years. Replacement donors and male blood donors showed higher seropositivity compared to voluntary donors and female donors¹².

Conclusions:

A higher rate of prevalence of HBsAg positivity was observed among hospital inpatient attendees compared to blood donors. Among blood donors, it was found that Sero positivity was more among replacement donors. Immunization status among the two groups found that blood donor group were better immunized than hospital inpatient attendee which was found to be statistically significant. The prevalence rates of Hepatitis may decrease over a period of time with the inclusion of Hepatitis B vaccination at birth along with OPV and BCG. Implementation of Mission Indradhanush seem to be a promising tool in near future, however till then, there is a serious need to vaccinate all the people with Hepatitis B vaccine, especially the hospital staff at the time of recruitment itself. This can minimise the risk of acquiring the infection and decrease the prevalence.

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