

**PREVALENCE OF HEPATITIS B INFECTION IN A TERTIARY CARE HOSPITAL, NORTH EAST REGION OF INDIA**Arun Ghosh<sup>1</sup>**HOW TO CITE THIS ARTICLE:**

Arun Ghosh. "Prevalence of Hepatitis B Infection in a Tertiary Care Hospital, North East Region of India". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 41, September 04; Page: 10413-10418, DOI: 10.14260/jemds/2014/3354

**ABSTRACT: BACKGROUND:** HBV Virus is one of the major health problems in India. Hepato cellular carcinoma due to HBV infection is 5th most frequent cancer in world wide. About 30% population has serological evidence of current or past infection with HBV. In the natural history of HBV infection, the most important event is HBeAg, Seroconversion is characterized by loss of HBeAg and development of antibody against HBeAg. **AIMS:** The aim of the study was to determine sero prevalence of hepatitis B infection among different age, sex groups and to understand the risk factors that define the development of HBsAg. **DESIGN -** The study design was based on clinical evaluation and serological testing. **METHODS:** The study was conducted in the Department of Microbiology of a tertiary care hospital, G.B. Panth Hospital. Agartala, West Tripura during the period over 5 years, 2001 – 2005. In this retrospective study, total 21, 121 numbers of patients serum were examined by ELISA method to detect the Hepatitis B surface antigen in different categories of patient as a marker of infection. out of 21, 121 patients, 1044 number of cases were seropositive showing the prevalence rate 4.94% in compared with hepatitis B virus infection in India is 4%. Details clinical history, age, sex, risk factors were recorded carefully. -

**KEYWORDS:** HBV infection, risk factors, HBsAg detection, Seroprevalence rate.

**INTRODUCTION:** A large number of studies on the epidemiology of hepatitis B virus infection have carried out over last two decades. This study includes the sample size, methodology for detection of hepatitis B virus surface antigen as serological marker, the age group covered in general population and risk factors associated with general population.

The purpose of hepatitis B virus surface antigen of the study was to identify the chronic carriers and to monitor and follow up the patients. More over this study will keep the clinicians evaluate patient response to treatment of chronic hepatitis B virus infection. Reduction or clearance of hepatitis B surface antigen is one indicator of good response.

Recent data has shown that hepatitis surface antigen clearance is associated with reduced disease progression to liver cirrhosis and liver cancer. Hepatitis B virus infection is a global public health programme. Nearly 2 billion people in the world have been acutely infected by Hepatitis B Virus and there are nearly 350 million people chronically infected.<sup>[1]</sup>

The average estimated rate of hepatitis B virus is 4%. Carriers placing India intermediate range for hepatitis B endemicity.<sup>2</sup> and giving total pool approximate 36 million carriers <sup>[2]</sup> Among the estimated 400 million hepatitis B surface antigen (HBsAg) carriers are in world wide. India alone contributes 9% of the total including Tripura state.<sup>[3]</sup> There are wide variations in social, economic and health factors in different regions of India in which hepatitis B virus carrier and prevalence rates were reported by investigators from different parts of country<sup>[4,5,6]</sup> Hepatitis D virus infection is frequent in India as in Intermediate level of Hepatitis B infection.

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Hepatitis B surface antigen was positive among the Voluntary Blood donor 2.6%, Professional Donor 12% and 1.4% Health care workers in North India.<sup>2</sup> HBV virus carrier rate among blood donors were found 11.7%.<sup>[7]</sup> Epidemiological pattern of HBsAg carrier and 14% of Voluntary blood donor were estimated and found that anti HBsAg positive.<sup>[8]</sup> Hepatitis B surface antigen (HBsAg) prevalence between 2% and 10% among the populations which were studied by Baskar Rao.<sup>[9]</sup>

Professional blood donor constitute the major high risk group for HBV infection in India having the surface antigen positive rate 14%.<sup>[2]</sup> Horizontal spread due to crowded living Conditions and poor hygiene. Acute and sub-acute liver failure is common complication of viral hepatitis infection. Hepatitis B virus is responsible for 70% cases of chronic hepatitis and 80% cases of cirrhosis of liver.<sup>[2]</sup>

There is utmost need for nationwide vaccination against hepatitis B virus because over all carrier rates is quoted 4.7% in India. (Insa, I.J.G report). Choudhury et al studied 7653 cases of rural population for HBsAg in the Birbhum District of West Bengal in all ages and both sexes; they found the prevalence rate of HbsAg 2-97%.<sup>[10]</sup> The situation of chronic hepatitis caused by hepatitis B virus constitute 50% in some parts of India.<sup>[11]</sup>

**OBJECTIVE:** This study was carried out to recognize the overall positivity rate among the patients of a tertiary care hospital, G.B. Panth Medical college Hospital. Agartata and to find out the risk factors associated with HBV infection.

**METHODOLOGY:** Total 21, 121 patients of the hospital were examined in the Department of Microbiology, Agartala Govt. Medical College & hospital during the period 2001 – 2005. The study design based on clinical evaluation and serological testing. 5 ml blood were collected aseptically.

Hepatitis B surface antigen detection by ELISA test was based on sandwich ELISA technique allowing qualitative detection of HBsAg in patient serum. Briefly, after bringing all the reagents & test specimens at room temperature, 50µl sample diluent was added to all wells except one blank in which 100µl of sample diluents were added.

Three negative control, 50µl in each, one positive control, 50µl and samples 50µl were added to micro wells according to the manufacturer instructions. Subsequently 50µl conjugate were also added to all wells, then covering with strip sealers, incubated for 60 minutes at room temperature.

After 60 minutes sealer removed and washed the wells with 350µl of washing solution by automated washer. And there after 50µl of color reagent added to all wells including blank and further incubate for 15 minutes in dark at room temperature. Now 100µl of stopping solution added to all wells and reading of optical density were taken at 450 nm (using 620 as reference wave length) within 15 minutes of test by ELISA reader. Positive samples were determined on the basis of cut off value.

**RESULTS:** Over the five years retrospective study period, 1044 of 21, 121 patients were positive for HBsAg. Among the positive cases 930(88.79%) patients were male and 114(11.20%) were female (Table-1) The distribution of HBV infection among positive infections were maximum in between 41 - 60 yrs of age group having the percentage 29.50% and 32.95% respectively (table2).

The risk factors associated with 1044 positive cases were parental injection 54.31%, renal dialysis 14.55%, H/O JC 11.78%, instrumentation 10.72%, Blood transfusion 4.02%, HBV vaccination

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2.29%, illegal sex 1.81%, Dental extraction. 87% respectively. (Fig-1) The overall prevalence rate of HBsAg was 4.94% (Table-1).

**DISCUSSION:** In this hospital based study the sero prevalence rate of HBsAg was 4.94%. (Table-3) The study was conducted over five years and large number of samples was tested. Dutta et al has found that the HBsAg positivity rate 35.3% in male and 19.3% in female. They observed that hepatitis B infection is more common in male although the sample size was small.<sup>[12]</sup> In another study of P.Jain et al also found that the positivity of HbsAg was more prevalent among males 62.54% in comparison to female 23.22%.<sup>[13]</sup>

Another observation by Quadri et al documented that the prevalence of HBsAg is higher in males than females.<sup>[14]</sup> In the present study it was found that hepatitis B surface antigen is more common in males 88.79% in comparison with females 11.20%. Quamer S, et al explained the probable cause of females are suffering from Hepatitis B infection less than male because females probably clear HBV more efficiently in comparison to males.<sup>[15]</sup>

HBSAg is more prevalent among 41 -60 yrs group as supported by a Quadri et al<sup>[14]</sup> where as in the present study is similar with his study by co-relating that the HBSAg is more common in 41 -60 yrs group.

The overall prevalence rate of HBsAg in the present study is 4.94% which is coming close with overall positivity rate in India 4%, with a little difference. Bhattacharya et al found the prevalence rate of hepatitis B virus infection 1.66% in West Bengal, Kolkata which was low in compare with other studies in different parts of India.<sup>[16]</sup> The Sero prevalence rate of Hepatitis B infection had been documented by Behal R et al in their study at Kanpur 2.25%<sup>[17]</sup> Chandrasekaran et al had shown in their work on hepatitis viral marker HbsAg among the population of Madurai, south India 7%<sup>[18]</sup>

Williams et al studied 54 cases of multi transfused patient in Delhi, they found the prevalence rate of Hepatitis B infection 7.4%.<sup>[19]</sup>

Martha Baskar Rao screened hepatitis surface antigen of 385 cases preoperatively at SV Ayurvedic college and hospital, Tirupati and found 13 cases 7.6% patients were positive for Hepatitis B.<sup>[20]</sup> 1981 Blood samples were screened for Hepatitis B surface antigen among representative population of Tamil Nadu by Kurein et al and found Hepatitis B surface antigen prevalence 5.7%.<sup>[21]</sup>

Prasad SR et al observed in their study of hepatitis B surface antigen among tribal community of Arunachal Pradesh, North East region 8.44% which is quite high.<sup>[22]</sup>

A study of hepatitis B surface antigen among community at baiga of Madhya Pradesh were carried out by Reddy et al and found the prevalence rate of Hepatitis B infection 4.40%. They studied 91 cases out of that 4 were positive for hepatitis B.<sup>[23]</sup>

Another study by Chandra M et al among community people in lamda of south India found that Hepatitis B prevalence 5.20%<sup>[24]</sup> National health survey USA screened 1400 sample for Hepatitis B infection during the period 1988 -1992 and found hepatitis B surface antigen positive 4.80%.<sup>[25]</sup>

Therefore in the present study the prevalence rate among general population is 4.94% which is similar with the study findings of Reddy et al<sup>[23]</sup> and National Health survey USA<sup>25</sup> and also close to the findings of Kurein et al<sup>[21]</sup> and Chandra et al.<sup>[24]</sup>

More this study is coming nearer to findings of hepatitis B infection by different authors from different parts of India.<sup>[18],[19],[20],[22]</sup>

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The risk factor mostly associated with this study was parental injection 54.31%. Parental injection risk factor assessment was well documented by the study of Jeffrey canter et al. They studied 287 persons attended in weight reduction clinic in 1985 and took injection of human chorionic gonadotropin had evidence of 21% (60/287) hepatitis B infection.<sup>[26]</sup>

Renal dialysis associated as risk factor in this study was 14.55%. Richard et al studied 355 cases of haemodialysis patient in different haemodialysis unit during the period 1967 -1970. Found that hepatitis B infection were associated with 260 cases in haemodialysis patients and 95 in haemodialysis staff members.

The incidence of infection for center based patients and staff was 4.4 and 3.4 cases respectively per 100 people at risk.<sup>[27]</sup> Due to lack of attention, overlook the sterilization practices are leading to nosocomial infections that can be attributed hepatitis B infection.<sup>28</sup>

10.72% patients were associated with hepatitis B infection due to contaminated devices and instrument in the present study.<sup>[28]</sup> The prevalence rate of hepatitis B surface antigen in the study population. i.e., blood donor was 11.4% in rural Vietnam.<sup>[29]</sup>

Occult hepatitis B infection may represent a threat to safe blood transfusion. In the present study Hepatitis B infection rate was 4.2% with history of getting blood transfusion is comparatively lower than others national and international study.

Other risk factors associated with history of HBV vaccination, illegal sex and dental extraction were 2.29%, 1.81%, and.87% respectively. This present incidence of risk factors associated with hepatitis B infection is low in comparison to others study in this particular.

**CONCLUSION:** The results of this hospital based study may not be reflection of the state of Tripura but it will be helpful for future planning in public health interventional strategies.

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