



ISSN: 0975-833X

Available online at <http://www.ijournalcra.com>

International Journal of Current Research  
Vol. 12, Issue, 08, pp.13213-13214, August, 2020

DOI: <https://doi.org/10.24941/ijcr.39488.08.2020>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

## RESEARCH ARTICLE

### STUDY ON HEPATITIS 'B' SURFACE ANTIGEN (HbsAg) BY ELISA METHOD IN HEPATITIS 'B' VIRUS INFECTED PERSONS

<sup>1</sup>\*Dr. Spriha Smriti and <sup>2</sup>Dr. S. N. Singh

<sup>1</sup> MBBS, MD Tutor, Deptt of Microbiology, PMCH, Patna  
<sup>2</sup> MBBS, MD, Professor and HOD, Deptt of Microbiology, PMCH, Patna

#### ARTICLE INFO

##### Article History:

Received 15<sup>th</sup> May, 2020  
Received in revised form  
21<sup>st</sup> June, 2020  
Accepted 24<sup>th</sup> July, 2020  
Published online 30<sup>th</sup> August, 2020

##### Key Words:

Hepatitis virus, HbsAg, ELISA,  
Hepatocellular carcinoma.

#### ABSTRACT

**Introduction:** Hepatitis B is the single most important cause of viral hepatitis in developed and developing world. Hepatitis infection leads not only to acute viral hepatitis but in a number of cases it leads to carrier state which may progress to chronic liver disease, liver cirrhosis and even liver carcinoma. **Material and Method:** Patients were taken attending medicine and blood bank of PMCH, Patna. Total no of cases were divided in to three groups. The diagnosis of acute viral hepatitis was established on the basis of clinical presentation and liver function test characterised by hyperbilirubinaemia, serum transaminases etc. In the microbiology department serological test for hepatitis virus infection was done by ELISA method and result was noted. **Result:** In Group 1, Group 2 and Group 3 cases were tested. Observations showed that out of 38 cases of acute viral hepatitis the most common aetiological agent was Hepatitis B virus 55.26%. Hepatitis B virus is most common in 3<sup>rd</sup> decade of age group. Males were more affected than female. **Discussion:** Tandon *et al* (1984) have reported an incidence of hepatitis B in 42% of sporadic cases of acute viral hepatitis. The presence of HbsAg in the serum of 10-25% of patient of chronic hepatitis has been demonstrated by Wright *et al* (1969), Gitinick *et al*. (1969), Mathews and Mackay (1970) and Boyes and Klatskin (1970). Thyagarajan *et al*. (1978) reported that out of 93 patients screened with feature of chronic active liver disease 17 were HbsAg (18.3%). Conclusion- Hepatitis B surface antigen is the most common marker in hepatitis B virus infection.

Copyright © 2020, Spriha Smriti and Singh. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Citation:** Dr. Spriha Smriti and Dr. Singh, S. N. 2020. "Study on Hepatitis 'B' Surface Antigen (HbsAg) by ELISA Method in Hepatitis 'B' Virus Infected Persons.", *International Journal of Current Research*, 12, (08), 13213-13214.

#### INTRODUCTION

Hepatitis 'B' is recognized as a serious health problem. In 1965, when Blumberg & co workers observed a foreign substance, initially called Australia antigen, in the blood of an Australian Aborigine. Hepatitis 'B' the single most important cause of viral hepatitis in developing and developed world. Hepatitis B infection leads to not only acute hepatitis often death in short course of illness. But in number of cases it leads to carrier state and it is highly infectious viral condition of liver which may progress to chronic liver disease, liver cirrhosis and even liver cancer. Hepatitis B virus can also seen to cause extra hepatic immunological mediated disease like polyarthritis nodosa and glomerulonephritis. Hepatitis B virus infection is responsible for nearly two third of all chronic liver diseases and about 80% of hepatocellular carcinoma. Cirrhosis cases were also found to be HbsAg positive.

The hepatitis B virus is a 42 nm DNA viruses with an outer envelope and inner 27nm in diameter enclosing the that genome and DNA polymerase. It belongs to Hepadnaviridae family. Hepatitis 'B' virus is primarily transmitted through infected blood but recently the infectivity of virus has been demonstrated in the body fluid such as saliva, semen, tears and vaginal secretions. HBV is highly infectious disease and is a global problem. Individuals who come in contact with infected blood or body fluids are of risk of acquiring infection either medical or non-medical individual. Australia antigen is among the first serological markers that circulated in the blood of infected persons even 2-3 weeks prior to appearance of clinical symptoms. The level of HbsAg is especially elevated during symptomatic phase and decline there after. Antibody to HbsAg usually appear after 3-6 months & persists for many years. Detection of HBV using HbsAg as the marker to screen blood donors to reduce the risk of transmission of Hepatitis B Virus. Highly sensitive technique ELISA (Enzyme linked immunosorbent Assay) have become available for the detection of various serological markers of hepatitis B virus.

\*Corresponding author: Dr. Spriha Smriti,  
MBBS, MD Tutor, Deptt of Microbiology, PMCH, Patna.

## MATERIALS AND METHODS

- The study group was taken from the patients attending department of Medicine and blood bank of PMCH, Patna
- Total number of cases studied has been divided into following sub group:-

**Group I:-** This comprised of 38 cases of Acute viral hepatitis.

**Group II:-** This comprised of a total of 27 patients of chronic liver disease. 9 cases had chronic hepatitis, 12 had cirrhosis and 6 cases had hepatocellular carcinoma.

**Group III:-** The prevalence rate of HbsAg in our region were studied in 56 cases which included 33 healthy persons of different age groups and 17 adult voluntary blood donors, 6 patients suffering from chronic renal disease were included in this group for comparison.

### SELECTION OF THE CASES /CRITERIA FOR DIAGNOSIS

The diagnosis of acute viral hepatitis was established on the basis of clinical presentation of the patient and findings of the liver function test (LFT) characterised by hyperbilirubinaemia, serum transaminases at least 2 to 3 times higher than the normal and excluding other causes of this condition (drugs, toxins and infections). Detailed history was recorded particularly the presence of risk factors associated with the transmission of HBV e.g. a past history of jaundiced patient, history of injection and blood transfusion of 6 months history. LFT comprised of serum bilirubin, SGOT, SGPT, alkaline phosphatase, serum Protein, Hb%, TLC and DLC. In the microbiology department, serological test for hepatitis virus infection was done by ELISA method and result was read by ELISA reader. In this Presence or absence of HbsAg have been seen for.

## RESULTS

**Group 1:** 38 cases were admitted in the hospital were diagnosed as acute viral hepatitis on the basis of clinical presentation & liver function test. HbsAg was positive in 21 out of 38 cases. Most of the cases of HBV infection was found in 3<sup>rd</sup> decade of life although sporadic cases were found in all age groups. Out of 38 cases 27 were male of which 17 (62.96%) were HbsAg+ve & 11 cases were female of which 4 (36.36%) cases were HbsAg+ve Serum bilirubin of these patients ranged from 1.5 to 23.5mg%. Total serum protein > 8.0 gm %. S.albumin ranges from 1.2 – 3.5gm % S.alkalinephosphatase ranges from 106-227IU/L. SGPT value 90-310 IU/L whereas SGOT value ranged from 70-280 IU/ml.

**Group 2:** Study of Hepatitis B surface antigen (HbsAg) in chronic liver diseases. A total of 27 patients with chronic liver disease were studied. Out of 27 cases 9 cases had chronic hepatitis of which 5 were HbsAg +ve, 12 cases were having cirrhosis of liver of which 6 cases were HbsAg+ve. 6 cases developed hepatocellular carcinoma of which 2 cases were HbsAg +ve. In chronic hepatitis out of 9 maximum number of cases were found third and fifth decades. 7 cases were male and 2 were female.

In cirrhosis 12 patients were seen. The cases were confirmed by liver biopsy. Age of the patients ranged from 21 to 55 years. Maximum no. of cases occurred between 3<sup>rd</sup> to 5<sup>th</sup> decade. 9 cases were male & 3 was female. Out of 12 cases 6 cases were HbsAg+ve. A total of 56 individuals were studied 33 were healthy individuals. 17 were voluntary blood donors and 6 patients of chronic renal failure.

**Group 3:** Out of 33 healthy cases 3 were HbsAg +ve Out of 17 voluntary blood donors 2 were HbsAg +ve. Out of 6 cases 2 were HbsAg+ve. Out of 6 cases of chronic renal failure, 2 cases were HbsAg +ve (4 were males and 2 female).

## DISCUSSION

The observations show that out of 38 cases of acute viral hepatitis, the most common aetiological agent was hepatitis B virus 55.26%. Hepatitis B virus infection was found in almost all age groups (MC in 3<sup>rd</sup> decade). Males were more affected than female. Tandon *et al* (1984) have reported an incidence of hepatitis B in 42% of sporadic cases of acute viral hepatitis. The presence of HbsAg in the serum of 10-25% of patients of chronic hepatitis has been demonstrated by Wright *et al* (1969), Gitinick *et al* (1969), Mathews and Mackay (1970) and Boyes and Klatskin (1970). Thyagarajan *et al* (1978) reported that out of 93 patients screened with feature of chronic active liver disease 17 were HbsAg (18.3%). In 1971 Tong *et al.* reported that as many as 80% of the patients with hepatocellular carcinoma had chronic infectivity with hepatitis B virus. Hill *et al* (1973) using immunodiffusion technique found an incidence of 0.75 to 2.3% in blood donor and professional donor at Vellore. Roy Chaudhary *et al* (1989) at Calcutta reported 1.79% HbsAg positivity in voluntary blood donor and 5.84% HbsAg+ve in professional blood donor using ELISA method.

## REFERENCES

- Afer MJ, Purcell RH, Feinstone SM *et al* : In viral hepatitis : A contemporary assessment of etiology, epidemiology, pathogenesis and prevention. Edited Vyas GN, Chen SN and Schmidt R. P 359 1987.
- Ge JH. *et al* : Antigenic and immunogenic changes due to mutation of S gene of HBV. *World J Gastroenterol* 2004; 10(21):3137-40.
- Shanmugam, J. Balkrishnan, V. Venugopalan and Sakumaran C. *IJMRP*, 91-96, 1978
- Valanne A *et al* : Rapid and sensitive HbsAg immunoassay based on fluorescent nanoparticle labels & time resolved detection : *J Virol Methods* 2005 Oct. 129 (1) : 83-90
- Waterhouse IAH. Muir *Cet al* : International Agency for Research on Cancer 3: 1977.
- Zuckerman : *Liver Annual. Viral Hepatitis Vol 3. Pg 149, 1983*