

# DETERMINATION OF *HEPATITIS B* SURFACE ANTIGEN (HBsAG) AMONG PEDIATRIC PATIENT ATTENDING EMERGENCY PEDIATRIC UNIT (E.P.U) UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL, BORNO STATE

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## **ABSTRACT**

*This research work was aimed at determining Hepatitis B surface antigen (HBsAg) among children in University of Maiduguri Teaching Hospital, Borno State. Total of 50 blood samples were collected from children attending E.P.U, 26 were females while 24 were males. Bloods samples were screened by vertical diagnostic method using one step strip style HBsAg rapid screen test (Global Diagnostic Canada) for HBsAg. Overall incidence rate of HBsAg was 6%. it showed that the incidence was higher among age group < 1-10 years, a total of 50 samples with 2 (4%) tested positive for HBsAg, also from age group ranging from 10-15 years, one (1) sample was found to be positive having the incidence rate of 2% while other 47 samples were negative, HBsAg was only found among females children 3 (6%). This study however, confirmed the presence of HBsAg among children attending U.M.T.H Borno State. General surveillance, mass immunization and public health education is required to stop the spread of the infection among children in Maiduguri and indeed the whole society.*

## Introduction

Hepatitis B caused by the hepatitis B virus (HBV) has continued to be a global public health problem despite all effort to eliminate this chronic viral disease via education, screening, and vaccination program. It is at present projected that over 400 million people globally have chronic hepatitis B virus infection and as much as one million people die annually as a result of HBV related disease. The victims of chronic HBV may develop liver cirrhosis and or cancer (WHO, 2003). HBV can be transmitted via the same route as that of HIV (Willey et al, 2008). HBV is present in blood, and to a lesser extent perspiration, breast milk tears, and urine of infected individuals. The virus has been detected peripheral mononuclear cells, tissues of pancreases, spleen, kidney and skin and fluids like saliva semen, sweat, breast milk, tears, urine and vaginal secretion. Worldwide, 2 billion people have been infected with hepatitis B virus (HBV), 361 million have chronic infection and have a million die each year from HBV related liver disease or hepatocellular carcinoma accounting for over one million die annually. Knowledge of the intricate of viral infection and of the molecular biology of this fascinating virus has led to the successful development of a vaccine and treatment, sometime capable of eradicating chronic infection. HBV is DNA virus classified in the blood stream and replication occurs only in liver tissue (Cheesebrough M 2006). The intact infections virus is 42-47nm in diameter and aculeate in the blood in concentration as high 10<sup>8</sup> virions per/ml.

The determination of Hepatitis B surface antigen (HBsAg) Infection is 5-10% in south East Asia and 10% in North Europe and America (WHO, 2003). Pediatrics HBV determination in Nigeria varied by screening method but research revealed 12.30%. HBV infection appeared to be is hyper endemic in the case of Nigeria (Umulu et al, 2005). The increased efforts to prevent new HBsAg are urgently needed in Nigeria. HBsAg can be transmitted through sexual or household contact, or by vertical transmission, unsafe injection, but chronic infection acquired during infancy or child wood account for a disproportionately large share of world wide morbidity and mortality. In endemic areas most individuals are infected by vertical transmission (Wright, 2006). About 50-80% of person with hepatitis B virus (HBV) infection is asymptomatic or may present with mild flu-like symptoms. The majority of patient with HBV infection can expect full recovery. The hepatitis B surface antigen (HBsAg) is present during the acute phase and normally disappears during convalescence in some patients,

however, the antigen persist. The persistence of HBsAg in the serum for more than six months is an indicator of chronic carrier state. The carrier state in hepatitis B is established in about 5-10% of infected children (Deinhard et al, 1998). Carriers appear to be the most dangerous source of infection. There is a larger pool of chronic carriers in the world, the prevalence varying from 0.1% in developed countries (Europe, America, and Australia) to 15% of the population in the developing countries (Doraisingham, 1979). Carrier state among the young has been found to be more infectious than among adults (Deinhar et al, 1998). Hepatitis virus is found in almost all part of the world, the virus is transmitted through direct contact or contaminated food or water. Hepatitis is relearning to the inflammation of the liver resulting from various cause i.e virus, bacteria, fungi and parasitic organism and also metabolic disorders. In fact viral hepatitis B account for 4% in Nigeria (WHO, 2003).

When a patient is queried for hepatitis B virus frequent or periodic liver function test (L.F.T) is required to maintain a good health so as blood test can determine whether you have the virus in your system or not and whether it is acute or chronic. Other diagnosis such as liver can also be done to see it there is any damage to the liver (WHO, 2003)

## **Methodology**

### **HBsAg test strip method**

HBsAg test strip method was used for the detection of HBsAg in the blood. This method which is immunochromatographic and qualitative in nature, detect the presence of HBsAg in human blood and be read in vitro having more than 99.9% sensitivity and 99.75% specificity. The interpretation of test result was performed according to the manufacturer's description.

One step strip method HBsAg, rapid screen test by diaspot diagnosis (Canada)

### **Sample Collection**

The method of sample collection employed was venepuncture technique by specialist in the EPU.

Blood sample were collected from 50 fifty pediatric children attending emergency pediatric unit (E.P.U) at U.M.T.H.

### Procedure for HBsAg Assay

All the samples were stored in the refrigerator, but brought to room temperature prior to analysis.

The test strip was immersed vertically in to the serum container with the arrow end pointing towards the serum specimen (It was immerse to the max line) the test strip was removed after 8-10 seconds. The result was interpreted as negative (non-reactive) positive (reactive) and invalid result respectively there are presented as follows

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### Result and Discussion

A total of 50 children were tested for HBsAg. 26 were females while 24 were male of which only 3 tested positive giving HBsAg.

Table 1: incidence rate of HBsAg among emergency patients in relation to age of the subject

Age Groups	No: of Tested	No: Positive (%)
Less than 10	33	2 (6%)
10-5	17	1 (5.9)
Total	50	3 (6%)

### Determination of HBsAg Antibody in Relation Gender

Sex	No: of Tested		No: Positive (%)
Male	24	(48%)	0 (0%)
Female	26	(52%)	3 (11.5%)
Total	50	(100%)	3 (6%)

### DISCUSSION

The HBsAg seropositivity of 6% among the study population was observed in this study. The prevalence of HBsAg in children population ranges from 2.7% to 13.3% (Awosere et al., 1999). The presence of HBsAg indicates ongoing HBV infection and in newly infected persons, HBsAg is the only serologic marker detected during the first 3-5 weeks after infection. In person who recover from HBV infection, HBsAg is usually eliminated from the blood in 3-4 months and anti-HBs develops (Mast et al., 2005).

Several studies have detected different HBsAg antigenemia rates in children in different parts of the country. Bukbuk et al., (2005) found HBsAg antigenemia 44.7% among pupils in rural Borno State.

In this study findings indicated that HBsAg positivity was higher among female children (11.5%) than male children (0.0%). The gender related prevalence of HBsAg was 9.5% in females and 24.1% in males (Pennap et al., 2010).

Also from this study it was observed that only children of age group less than 10 years had the highest prevalence of HBsAg 2 (6.06%) which could be via perinatal infection health workers, e.t.c. thus the administration of hepatitis B immune globulin to all healthy infant born to HBsAg positive women and women with unknown HBsAg status at birth or at most during 1

year of life is very important, before which the administration of Hepatitis B vaccine should have been given to pregnant women for protection of their fetuses (Awsoere et al., 1999) also in this study, HBsAg was only detected in children without history of vaccination. WHO reported no association of age with HBsAg seropositivity. However, it is consistent with the report by Uneke et al., 2005 who claimed that higher prevalence occur among a higher age related occurs among less than 30 years of age Pennap et al., (2010) reported a higher age related prevalence for HBsAg those age 1-40 years (13.8% and above 40 years (11.5%).

Also the percentage of the positivity was 3 (6%) and that of negativities was 47 (97%) the 3 positive sample were female children out 26 while none was positive among the 24 male children samples, the determination of HBsAg infection is higher among the group ranging from 5-10 with (6.1%) and less in the age group ranging from 10-5 with (5.19%) this shows that the incidence increase with an increase in age successfully (Uneke et al., 2005).

Moreover, the number of sample analyzed is negligible due to time constraint and availability of patient in the EPU, however, 3 positive in 50 samples is quiet alarming and hence there is need to create awareness and encourage vaccination among the population.

## REFERENCE

- Awosere KE, Arinola OG. Uche LN. 1999 Hepatitis B virus seroprevalence among pregnant women in university college hospital, Ibadan journal of Medical Laboratory Science 8: 77-82.
- Bukbuk DN, Bassi AP mangoro ZM 2005. Seroprevalence of Hepatitis B surface antigen among primary school pupils in rural Hawal Valley, Borno State, Nigeria. Journal of community medicine and primary Health Care 17 (1). 20-23.
- Cheesebrough M (2006), District labripractice in part 1 University press, Cambridge 239-258.
- Deinhardt Chang MH Senin fatal teaching hospital. (1998).
- Doraisinghan M.Y Global program for HBV control and prevention vaccine 1979-1995
- Mast EE, Alter MJ, Margolis HS., 2005. Advisory committee on immunization practices (ACIP), comprehensive immunization strategy to eliminate transmission of Hepatitis B virus infection in the united states: recommendation of the advisory committee part 1: immunization of infants, children, and adolescence MMWB Recomm Rep. 2005 Dec. 23; 54 (RR-16) 1-31 PMID 16371945.

Penap GR, Yakub A, Oyige O, Forbi J 2010. Prevalence of Hepatitis B and virus infection among people of a local community in Keffi . Nigeria. African journal of Microbiology Research 4 (4): 274-278.

Umolu P.I, Okoro, P. 2005. Human immunodeficiency virus, (HIV) African journal of Health Science, 55-58

Uneke CJ. Ogbu PuI, Anyanwu GI Njoku MO, IOKO JH. 2005. Prevalence of Hepatitis B surface antigen among blood donors and HIV infected patient in Jos Nigeria. Journal Mem inst Oswaldo Cruz Riode Janeiro 100 U):

W.H.O 2003, Washington estimation, HBV infection and therapy page 17-19.

Willey JM, Sherwood LM E.J 2008, Harley and Kleihs microbiology (4<sup>th</sup> Edition)

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