Prevalence of HepaTitis B Surface Antigen Among Blood Donors and Patients Attending General Hospital Potiskum

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ABSTRACT: The prevalence of Hepatitis B Surface Antigen (HBSAG) among blood donor and patient attending general hospital Potiskum is increasing at alarming rate. In this study, one hundred (100) blood samples were collected from males (72) and females (28) within the age group of 1-60 years. The 100 samples collected 49 were positive HBV infection while 51 were negative. The prevalence of hepatitis B in different sexes showed that males had the highest prevalence with rate 14%. Among blood donors, the highest prevalence was in the age groups 2-10 years with 6% each. Followed by age groups 11-20 years, 2%, 30-40 years, and 51-60 yrs had the highest HBV infection with 8% though is low but can become the potential source of spread in the society. It is, therefore, suggested that work be done in this area of study on a large scale to determine the nature of HBV infection in both patients and donors attending General Hospital Potiskum.

Keywords: solar cells, temperature, light intensity, tilt, orientation

INTRODUCTION

Hepatitis means inflammation of the liver. Common cause of infection are contact with one of the five (5) viruses called hepatitis A, B, C, D and E. All of these virus can cause an acute disease, with symptoms including yellowing of skin and eye (Jaundice), dark urine, extreme fatigue, vomiting, abdominal pain, liver inflammation and rarely death. Chronic hepatitis B may eventually cause liver cirrhosis and liver cancer a vital disease that shows poor response to current chemotherapy. The risk factors of liver cancer and liver cirrhosis include infection with hepatitis B and C viruses (HBV and HCV); exposure to aflatoxin due to specific food handling practices and storage conditions; alcohol use, especially binge drinking; and smoking. HBV prevalence is high in sub-Saharan Africa and Asia, where it is responsible for a large proportion of liver cancers; HCV's role is most important in sub-Saharan Africa, the middle east, Central and East Asia, and Eastern and Southern Europe(Shepard, Finelli and Alter, 2005; Martel et al., 2012; Ott, Stevens, Groeger and Wiersma, 2012; Majid and Elio, 2012). Food handling and practices can be linked to the study group; Groundnut have been found to be one of best food plant produce in this region of the country, the traditional preservative method may favored the growth of aflatoxin which can triggered the HBV and HCV. In addition the groundnut with poor storage conditions is often consume raw without further processing.

Hepatitis B virus infects the liver of hominoidae including humans and causes an inflammation called hepatitis. The disease has been originally known as “serum hepatitis and epidemic in part of Asia and Africa.” Hepatitis B is endemic in China and various other parts of Asia (Williams, 2006). The proportion of world population currently infected with the virus is estimated at 3 — 6%. The Hepatitis Virus and yellow fever Virus are among the most important causes of acute inflammation and necroses of the liver. Hepatitis is occasionally associated with other common viral infections such as cytomegalovirus and Epstein Bar virus also there are several causes that do not normally cause liver damage but sometimes display hepatitis resulting in Jaundice. These groups of viruses include, adenoviruses, rubella viruses, para si myxoviruses a member of enter viruses particularly Cox sakie A and B virus and herpes simplex virus (Husing, 1989). There are two (2) main transmissible hepatitis namely: infective hepatitis caused by hepatitis A virus with incubation period of 20 — 40 days, and serum hepatitis caused by hepatitis B Virus with incubation period of about 60—80 days. Serum hepatitis was first distinguished from infective hepatitis in 1926. When it was recognized that causes of hepatitis cocooning inpatient attending a diabetic clinic were due to an infection agent transmitted from one patient to another by improperly sterilized syringes and needles and that incubation period was much longer than that of...
infective hepatitis (Sterwart and Beswick, 1919). Infection with hepatitis B virus (HBVV) is a widespread problem. It was rated by WHO as the 9th major causes of death worldwide far ahead of the dreaded disease AIDS.

Nigeria belongs to the group of countries with endemic hepatitis B virus infection because 75% of the population must have been exposed to the virus one time or the other in their life. It was reported that hepatitis B causes an estimated figure of one to two million deaths per year worldwide (WHO, 1982 and Ferruccio, 1992). The epidemiological survey shows that approximately 5-20% of the world population are asymptomatic carriers of the virus the rate varying from zero import of the western world to over 15% in some Asian and African countries. The virus can be transmitted through sexual contact that produces demic in male homosexual/parenteral routes of transmission included: acupuncture and tattooing. Vertical and horizontal transmission has been recorded (Hollinger and Dienstag, 1995). The clinical symptoms of hepatitis B virus in patient include an iodica1 illness in which a patient complains of malaise and anorexia accompanied by a cecal or muclo popular rashes. These features have been implicated in the rare complication of a polyarthritis, nongloma and omenlo nephritis (Darien, et al., 1997). The aim of this research work is to unveil the hidden and silent danger disease among the donor and patient attending the General Hospital Potiskum in Yobe State.

**History of Hepatitis B Virus**

The earliest record of an epidemic caused by hepatitis B virus was made by Lurman in 1885. From an outbreak of smallpox occurred in Bremen in 1883 and 1,289 shipyard employees were vaccinated workers became ill with jaundice and was diagnosed as suffering from serum hepatitis. Other employers who had been inoculated with different batches of lymph remained healthy. Lurman’s paper now regarded as a classical example of an epidemiological study proved that contaminated lymph was the source of the outbreak. Later numerous similar outbreak were reported that follow up the introduction in 1909, of hypodermic needles that were used and more importantly reused for administering salvation for the treatment of syphilis. The virus was not discovered by the Australian antigen (latter known to be hepatitis B surface antigen or HBSAg). In the blood of Australian originated people. Although a virus has been suspected since the research published by Mac Cam in 1947. In 1970, Dane and others discovered the virus particle by electron microscopy (Dane, 1970). By the early 1980s genome of the virus had been sequenced (Galibert, 1979) and the first vaccines were being tested.

**Mode of Transmission**

Transmission result from exposure to infected blood or body fluid containing blood. Possible forms of transmission includes (but are not limited to) unprotected sexual contact, blood transmission, reuse of contaminated needles and syringes and vertical transmission from mother to child during childbirth without intervention, a mother who is positive for the hepatitis B surface antigen counts a 20% risk passing the infection to her offspring at the time of birth. This risk is as high as 90% if the mother is also positive for the hepatitis B antigen. HBV can be transmitted between members within households, possibly by skin contact or mucus membrane with secretion or saliva containing HBV. In Russia and Japan, where 2-5% of the population is chronically infected, the diseases are predominantly spread among Children in high prevalence areas such as China and Southern Asia. Transmission during childbirth is most common although in other areas of the high endemic city such as Africa transmission while childbirth is a significant factor. (Alter, 2003). The prevalence of chronic HBV infection areas of the high endemic city is at least 8%.

**The Carrier State**

The carrier state defined as the persistence of HBSAg in the blood circulation for more than two months. The carriers’ state may be lifelong and may associated with mild liver damage varying from minor changes and liver function to chronic active hepatitis and hepatocellular carcinoma.

The carrier state is more likely to occur if the infection occurred in carrier child rather than adulthood it is more frequent in male and more likely occur in those with required or natural immune deficiencies. Approximately half the carriers are “E” Antigen Positive A Carrier state is established in 5-10% of infected adults the “E” antigen is also more likely to be Positive in Younger Carriers.

**Clinical Feature**

In hepatitis offset, Jaundice is often produced by gastrointestinal symptoms such as nausea, vomiting, anorexia, and mild Fever, Jaundice may appear within a few days of the prodromal period but is more common. The extra-hepatic manifestation of viral hepatitis (primary type B) includes serum sickness like prodrome consisting of fever, skin rash, arthritis, necrotizing vasculitis, circulating immune complexes have increased as the cause of these syndromes. The median incubation period is between 50-180 days average 60-90 days.

**Pathogeneses and Pathology**

The hepatitis B virus primarily interferes with the function of their host by replication in the liver cell. During HBV infection, the host immune responses cause both hepatocellular damage immune responses as both
hepatocellular damages and viral clearance, although the immune does not play significant role in the processes, the adaptive immune response particularly virus-specific cytotoxic. Lymphocytes (CH) attributes to most of the liver injury associated with HBV infection. By killing infected cell and by producing antiviral cytokines capable of purging HBV from viable hepatocytes, CTLs climate the virus. Although liver damage initiated and mediated by the CTLs non-specific inflammatory cell can worsen CTL induced immune pathology. Platelets activated at the site of infection may facilitate the accumulation of CTL into liver (Locamine et al., 2005)

**Treatment of Hepatitis (B)**

Alpha-interferon were the first drugs approved in the United States for the treatment of HBV is recommended for an individual who has "replicative disease" (HBSAg positive). About 4% of such individual would lose serum after six weeks of treated patients (less than 10%) may even cure, as assessed by the less of HBSAg (WHO, 1998). Patients treated with interferon-Alpha should have evidence of infection with hepatitis B view, documentary the presence of hepatitis B surface antigen in the blood for six month. The patients should also have evidence of viral replication, documented by the presence of hepatitis B with the rejection of seropositive donors. Administration of hepatitis B immune globulin to individual who sustained continuous exposures to HBV containing blood or other body fluid (WHO, 1998). Vaccine for active immunization has been developed and will play a major role in preventing HBV infection in the future (Gatchalian, 1997).

**MATERIAL AND METHODS**

The study area was Potiskum town of Yobe State. The state is in the northeastern geographical Zone (120°NE) of Nigeria. Potiskum is bordered by Nangere-Gashu’a LGs in the north, Bauchi State from the west, Gombe State in the south and Fune Local Government in the east.

4ml of blood collected from the vein of patient and blood donor into a clean and dry, sample bottle. The whole blood sample was allowed to clot, and serum was clarified by centrifugation at 2, 500rpm for 3 minutes. The serum then kept at 4°C temperature and was tested within 6 hours after collection. Hepatitis B antigen strip (ACON) was used for this analysis. The ACON HBsAg test strip was removed from the foil pouch and was used within 1 hour after removal from the pouch. When a sample of blood from an individual infected with HBsAg collected into a container, the test strip was Immersed in to the serum samples with arrows pointing toward the serum, when two bands (lines) appeared on the test area indicates a positive sample but if one band appeared, the sample is said to be negative, and if the band (line) appear only at test area, the test is recorded as invalid.

**RESULTS AND DISCUSSION**

In this study, a total of 100 samples was collected from Genera1 Hospital Potiskum from blood donors and patient. Out of the 100 samples, 30 were blood donors while 70 were patients (Table 1). The prevalence of HBSAg antibodies among blood donors were 11% males while 19% of the remaining male’s donors were HBSAg negative. The prevalence of HBSAg in females is zero because only males that donate blood. The prevalence of HBSAg infection among male patients were 24% while 18% of the remaining male patient were negative, and the Prevalence in female patient read as 14% while 14% of the remaining were negative.

The highest hepatitis B virus infection was found among the age group between 21-30 years with 16%. The lowest prevalence was found among the age group between 11-20 years with 2% in blood donors (Table 2). The prevalence among patients was highest in the age group between 11-20 years with 17% positive cases while the lowest was among the age group 41-50 years with 3% positive case (Table 3).

The Table 1 shows the list and figure of Donors and Patients subject in this study.

**TABLE 1. PATIENTS AND DONORS DISTRIBUTION**

<table>
<thead>
<tr>
<th>Specimen</th>
<th>No. of Sample</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donors</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Patients</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The Table 2 below shows the Age distribution among Donors in the sample group.
TABLE 2. AGE DISTRIBUTION AMONG THE DONORS

<table>
<thead>
<tr>
<th>Age Group (Year)</th>
<th>No. of Sample (%)</th>
<th>Positive cases (%)</th>
<th>Positive cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>11-20</td>
<td>2</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>21-30</td>
<td>16</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>31-40</td>
<td>7</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>41-50</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td><strong>11</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

The Table 3 below shows the Age distribution among Patients in the sample group.

TABLE 3. AGE DISTRIBUTION AMONG THE PATIENTS

<table>
<thead>
<tr>
<th>Age Group (Year)</th>
<th>No. of Sample (%)</th>
<th>Positive cases (%)</th>
<th>Positive cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>13</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>11-20</td>
<td>17</td>
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</tr>
<tr>
<td>21-30</td>
<td>16</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>31-40</td>
<td>12</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>41-50</td>
<td>3</td>
<td>4</td>
<td>0.0</td>
</tr>
<tr>
<td>51-60</td>
<td>9</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>38</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>

**Discussion**

The hepatitis B virus infection is endemic all over the world. Infection results in inflammation of the liver. In apparent or subclinical infection and infection without jaundice are common in overt diseases. The clinical picture ranges from a mild anicteric illness to acute disease with jaundice to severe, prolonged jaundice to acute hepatitis. Symptoms of acute illness caused by the virus include liver inflammation, vomiting; jaundice and rare; death. Chronic infections may eventually cause liver cirrhosis and liver cancer a vital disease with very poor response to current chemotherapy (Wilson, 2006). The result of this study showed that all the 100 samples collected from both blood donors and patients; indicated 49% are positive for HBSAG; while 51(51%) samples negative. The prevalence of HBSAG in different sexes showed that the male had the highest rate of infection 24%. The age group 21-30 years has the highest rate of HBSAG infection and this corresponds with the report of the center for disease control that indicated that; the highest rate of the disease occur between 20-49 years(WHO,1998).

The result analysis also showed that hospital patient have a higher prevalence rate than the blood donors and also age group51-60 years in blood donors categories was not contacted because they were old to donate blood. Due to conflicting reports on some disease like HBSAG infection on which disease is responsible for the occurrence another disease predisposes patient. This suggested an acute hepatitis B infection does not usually require treatment because most adult clear the infection spontaneously (Hollinger et al., 2010, 2007). Early antiviral treatment may only be required in less than 1% of a patient whose infection takes a very aggressive course (fulminate hepatitis). Or immunocompromised on the other hand; treatment of the chronic infection may be necessary to reduce the risk of cirrhosis and liver cancer. Chronically infected individuals with persistently elevated serum alanine aminotransferase a marker of liver damage of HBV DWA levels and the candidate for therapy (Tetsuo et al., 2007). Also, study on the differences between acute infection and carrier state is important since this is of a clinic and epidemiological importance.

**CONCLUSION**

It must be accepted that hepatitis B virus infection is endemic in the study area and may spread to other states in the country. The disease does not discriminate against sex or race. Hepatitis B vaccination program has been properly established and managed in a national immunization program that will go a long way in the country in the prevention of the disease. It is therefore suggested that, larger sample coverage as well as more work need to be done nationwide to determine the national incidence and prevalence rates Hepatitis Viruses.
REFERENCES