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PREVALENCE OF HEPATITIS B VIRUS INFECTION AMONG PREGNANT WOMEN IN AN ANTENATAL CLINIC IN PORT HARCOURT, NIGERIA.

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Abstract

A total of ten thousand and thirty two (10,032) pregnant women attending ante-natal clinic in Braithwaite Memorial Hospital, Port Harcourt, Nigeria were screened between January 2000 to December 2004 for the possible occurrence of hepatitis B virus using HBV paper strips. The results showed that a total of 290 (2.89%) of the pregnant women tested positive for hepatitis B Virus. The years 2001 and 2002 had the highest prevalence of 61, while 2004 had the least prevalence of 52. No significant difference (P<0.5) was however observed in the annual prevalence of the infection among pregnant women in the hospital. Studies of the age distribution of the infection among the studied pregnant women showed that women in the age group of 41-45 had the highest prevalence rate (60%) for the sampled population within that age group, followed by women in the age group of 31–35 with an occurrence rate of 11.04% within that age group. The least rate of occurrence was observed in the age group of 21 – 25 which showed only 1.75%. The prevalence of the deadly hepatitis B virus among pregnant women whose immunity is often compromised by gynaecological and nutritional factors is of grave clinical importance.

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INTRODUCTION

Hepatitis is an inflammation of the liver (1). The word is derived from a combination of two Greek words *"Hepatos"* (Liver) and *"itis"* (inflammation) (2). The disease can be occasioned by several factors including viral infection. Many viruses cause hepatitis and advances in molecular biology and virology techniques have led to the identification of pathogens responsible for acute and chronic hepatitis (3). To date at least six hepatitis viruses have been recognized, and these have been named: Hepatitis A, B, C, D, E, and G. Acute hepatitis may also occur as part of the clinical course of a number of viral infections including human cytomegalovirus, Epstein – Barr virus, herpes simplex virus, yellow fever virus and rubella (4).

Hepatitis B is one of the major diseases of mankind and is a serious global public health problem. Of the 2 billion people who have been infected with the

hepatitis B virus (HBV), more than 350 million have chronic (lifelong) infections. These chronically infected persons are at high risk of death from cirrhosis of the liver and liver cancer, diseases that kill about one million persons each year (5). In endemic areas, where carrier rates are >5%, most individuals are infected perinatally, by vertical transmission, or in early childhood (6).

Hepatitis B infection is caused by hepatitis B virus (HBV) which is a circular double stranded DNA virus in the family, *Hepadnaviridae*. The HBV genome has four genes, *pol, env, precore* and *X*, that encode the DNA polymerase, envelop proteins, precore protein (which is processed to viral capsid) and protein X respectively. The function of protein X is not clear, but it may be involved in the activation of host cell genes (7). The virion also known as a Dane particle has a diameter size of 42 to 47nm, with an electron-dense core of 27 nm. Three well-defined antigens are associated with the virus. These are HbcAg and HbeAg (described as core proteins and contained in the nucleocapsid) and HBs Ag (described as surface coat protein) which is found in the outer envelope of the virus (8).

HBV is a hardy virus that can exist almost on any surface for up to one month. The virus remains infective for days in dry blood and for months when stored in serum at room temperature. (9). Hepatitis B infection is an ancient disease that has been found in all populations though the incidence and risks are high among people living under crowded conditions, drug addicts, the sexually promiscuous and people in certain occupations involving blood or blood products (9).

Hepatitis B is usually transmitted parenterally through transfusions of blood and blood products, sharing of needles and razors, tattooing and acupuncture, renal dialysis, organ donation and sexual intercourse. Horizontal transmission is possible in children, families, and 'close personal contact'. Vertical transmission occurs perinatally from a carrier mother to her baby through the placenta and during delivery (4; 10).

This study was designed to create awareness as to the prevalence and menace of hepatitis B virus infection and its possible consequences on maternal and infant health in Port Harcourt, Rivers State, Nigeria in order that appropriate preventive steps could be taken by Medicare providers to safeguard pregnant women and their babies from hepatitis B virus infection.

MATERIALS AND METHODS

Study Population:

A total of 10,032 pregnant women who presented themselves at Braithwaite Memorial Hospital, Port Harcourt, Nigeria were used for this 5-year study which spanned from 2000 to 2004. The purpose of the study was fully explained to them and their informed consent obtained prior to the study as recommended by the World Health Organisation (11).

Sampling:

The presence/absence of the virus was determined using hepatitis B virus (HBV) strips according to the method of Levy *et al* (12) based on the principle that hepatitis B antibody present in serum binds to the hepatitis B antigen present in the strip forming an immune complex. The reaction is visualized by the presence of a chromogene impregnated in the strip showing a red coloration which indicates a single red line for a negative reaction and two red lines which indicate a positive reaction (12).

Briefly, a blood sample was collected from each patient with the aid of a syringe and was left to stand before centrifuging at high speed for 15 mins. The

resulting serum was left to equilibrate at room temperature and then the paper strip was dipped into the serum (vertically) for 15 seconds. Each strip was then placed on a flat non-absorbent white tile and the results read after 15 minutes taking appropriate precautionary measures (12).

RESULTS AND DISCUSSION

Table 1 presents the annual distribution of cases of hepatitis B surface antigen among pregnant women attending Braithwaite Memorial Hospital, Port Harcourt, Nigeria. The results indicate that 2001 and 2002 had the highest occurrences of pregnant women with the HBsAg (61 cases each) while 2004 had the least occurrence of 52 cases. There is therefore no significance difference ($P< 0.5$) in the annual distribution of hepatitis among pregnant women in the hospital. Table 1 also shows the monthly occurrences of HbsAg. The result shows that the mean occurrence of hepatitis B was highest in January (31 patients) followed by October (30) while the least occurrence was in the month of July (14) followed by May (15). The occurrences of hepatitis B surface antigen among pregnant women attending the hospital was therefore significantly lower ($P<0.5$) in July and May and significantly higher ($P <0.5$) within the months of October and January (except for December) suggesting that the disease occurred more during the dry season.

Table 2 shows the age distribution of hepatitis B in pregnant women in Braithwaite Memorial Hospital. The highest prevalence was recorded between the age bracket of 41 -45 (60%) while the lowest was between the age bracket of 21 - 25 (1.75%).

Table 1: Annual distribution of hepatitis B among pregnant women attending Braithwaite Memorial Hospital.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept.	Oct.	Nov.	Dec.	Total
2000	9	8	4	5	2	6	2	4	6	7	3	4	60
2001	4	6	3	6	2	6	3	5	8	4	8	6	61
2002	9	4	6	5	3	7	5	3	5	7	2	5	61
2003	4	5	2	5	4	7	4	5	3	6	6	5	56
2004	5	3	5	3	4	3	4	5	2	6	8	4	52
TOTAL	31	26	20	24	15	29	18	22	24	30	27	24	290

Table 2: Age distribution of Hepatitis B Prevalence in the studied hospital in Port Harcourt, Nigeria.

Age interval	Total Screened	HbsAg Positive	HBsAg negative	% Positive
15- 20	519	30	489	5.78
21 – 25	3762	66	3696	1.75
26 – 30	3820	94	3726	2.46
31 – 35	480	53	427	11.04
36 – 40	1441	39	1402	2.70
41 – 45	10	6	4	60

The fact that there was no significant difference ($P<0.5$) in the annual distribution of hepatitis B antigen in the hospital within the five years interval indicate that there was no annual variation in the disease prevalence. This would then mean that the incidence of the disease in the hospital may have been there long before our research. Our results are therefore of clinical significance to the hospital because high hygienic conditions will need to be maintained to ensure that some of the positive cases are not from nosocomial infections. This need is further heightened by the fact that the pregnant women will readily transmit the infection to the fetuses and/or the neonates. Hepatitis B virus has a high rate of vertical transmission causing fetal and neonatal hepatitis. Hepatitis A, C and E are rarely transmitted trans-placentally (13).

Also, the prevalence of the infection was higher between the months of October and January. This could be due to increased exposure to the risk factors within this period and also due to the season. Exposure to risk factors as well as season of transmission are known determinants of the possible intensity of infection (4). In the months of May and July the prevalence of the infection was at its lowest ($P<0.5$). This could also be as a result of reduction in the rate of exposure to the risk factors.

The dangers inherent in the observed cases of hepatitis are legion and call for conscious efforts to address them especially as it has been reported that infection acquired perinatally and in early childhood is usually assymptomatic, becoming chronic in 90% and 30% respectively. But in those people who experience disease, the severity of symptoms and the aftermath of hepatic damage vary widely. Liver damage is usually mild during childhood; severe liver disease, including cirrhosis and hepatocellular carcinoma (HCC) may develop insidiously for 2-7 years (14). Yet it is known that approximately 90% of infants of HBs Ag seropositive mothers become chronic hepatitis B surface antigen (HbsAg) carriers. When a woman goes into labour there is a massive exchange of blood; the virus can therefore be passed from the mother's blood to the newborn through the umbilical cord. The blood exchange occurs before delivery and so even a caesarean section will not prevent infection (15, 16).

Finally, we recommend that all pregnant women be screened for hepatitis B surface antigen HbsAg during antenatal visits. It is already recommended (17) that all infants be vaccinated against hepatitis B at birth to further reduce any potential risks of infection. It is also important that blood given to pregnant women in need of it be screened before transfusion. It is also important that pregnant women reduce the rate of their patronage of commercial pedicure and manicure outfits since their instruments, shared among their numerous customers, could be a potential abode of hepatitis B virus. The present observations are also of national and international interest since it is assumed (especially in Nigeria) that hepatitis B infection is of little gynaecological importance.

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