

The prevalence of hepatitis B and C viral infections among pregnant women

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Abstract

Background: Viral hepatitis during pregnancy is associated with high risk of maternal complications and has become a leading cause of foetal death. **Aims:** This study aimed at determining the prevalence of hepatitis B and C viral infections among pregnant women attending the antenatal clinic of the University of Benin Teaching Hospital. **Patients and Methods:** This was a hospital based cross-sectional study that included 5760 pregnant women who attended the antenatal clinic of the hospital during the periods of October 2009 - October 2010. Relevant data was gathered and women having history of previous liver diseases, diabetes and pre-eclamptic toxemia were excluded from the study. Rapid diagnostic test kits were used to screen for Hepatitis B surface antigen (HBsAg) and anti-Hepatitis C virus (HCV) antibodies. **Results:** 720 (12.5%) and 206 (3.6%) out of 5,760 pregnant women included in the study were found to be positive for Serum antibodies to hepatitis B and C respectively. 33 (0.57%) were found to have mixed infections of hepatitis B and C. None of the expected risk factors had significant outcome. **Conclusion:** This study showed that the prevalence of the Hepatitis B virus (HBV) among pregnant women in this study area is of intermediate endemicity (12.5%).

Keywords: HBsAg, HCV, pregnant women, prevalence, risk factor.

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Introduction

Hepatitis is an inflammation of the liver characterized by the presence of inflammatory cells in the tissue of the organ. It may occur with limited or no symptoms, but often leads to jaundice, anorexia (poor appetite) and malaise. Hepatitis is acute when it lasts less than six months and chronic when it persists longer [1]. A group of viruses known as the hepatitis viruses cause most cases of hepatitis worldwide, but it can also be due to toxins (notably alcohol, certain medications and plants), other infections and autoimmune diseases [2]. The hepatitis virus is found in the blood and other body fluids and is transmitted from person to person, the most common routes of infection includes blood transfusions and blood products where there is no screening for blood-borne viruses, medical or dental interventions in countries where

equipment is not adequately sterilized mother to infant during childbirth, sexual transmission (in the case of hepatitis B), sharing equipment for injecting drugs, sharing straws, notes etc. for snorting cocaine (cocaine is particularly alkaline and corrosive), sharing razors, toothbrushes or other household articles, tattooing and body piercing if done using unsterile equipment [3]

The hepatitis B virus is spread between people through contact with the blood or other body fluids (i.e. semen, vaginal fluid and saliva) of an infected person, while the hepatitis C virus is spread through direct contact with infected blood. Very rarely it can also be passed on through other body fluids. Many people infected with hepatitis B or C rarely displays any symptom, although they can still transmit the virus to others [4].

Hepatitis B is a major disease of serious global public health proportion. It is preventable with safe and effective vaccines that have been available since 1982. Of the 2 billion people who have been infected with the hepatitis B virus (HBV) globally, more than 350 million have chronic (lifelong) infections [5]. Over 20 million people are infected annually with this virus [6]. Hepatitis C is a viral infection of the liver and is the most common blood-borne (direct contact with human blood) infection. The major causes of HCV infection worldwide are use of unscreened blood transfusions, and re-use of needles and syringes that have not been adequately sterilized. The world health organization (WHO) estimates that about 3% of the world populations (200 million people) have so far been infected with the Hepatitis C virus [7]. Almost 50% of all cases become chronic carriers and are at risk of liver cirrhosis and liver cancer [8].

Viral hepatitis during pregnancy is associated with high risk of maternal complications. There is a high rate of vertical transmission causing fetal and neonatal hepatitis which can have serious effects on the neonate, leading to impaired mental and physical health later in life. A leading cause in maternal mortality [9] is also said to be the most familiar cause of jaundice in pregnancy [10]. Peri-natal transmission of this disease occurs if the mother has had acute Hepatitis B infection during late pregnancy, in the first postpartum or if the mother is a chronic HBsAg carrier [11]. Hepatitis C transmission occurs predominantly around time of delivery and pregnancy [12]. Using this background information, the epidemiology of viral hepatitis during pregnancy is essential for health planners and program managers [13]. Thus, the current study aimed at investigating the prevalence and the possible predisposing factors for Hepatitis B and C viruses among antenatal women attending the University of Benin Teaching Hospital.

Patients and Methods

This study was conducted at the University of Benin Teaching Hospital (UBTH) located in the heart of Benin City, Edo state Nigeria. UBTH is a major referral centre for a number of privately owned hospitals and state specialist hospitals within and outside the state. Hence it was thought germane to use this center as a study site among other hospitals in the City.

This study was a hospital based cross-sectional study that included 5760 pregnant women who attended the antenatal clinic of the University of Benin teaching hospital, during the periods of October 2009 – October 2010. Relevant data was gathered and women having history of previous liver diseases, diabetes and pre-eclamptic toxemia were excluded from the study.

Blood sample was obtained by vein-puncture, and serum was separated and stored in a refrigerator. The serum was brought out of the refrigerator for it to equilibrate with room temperature before testing. After centrifugation, the sera were tested for HBsAg and anti-HCV using ELISA kit

(Clinotech Diagnostics, Canada). Positive and negative control serum samples were run alongside test.

Statistical Analysis

Data were analyzed using SPSS version 15.0 and an independent T-test method. Significance was determined at $P < 0.05$.

Results

During the study period 5,760 women were enrolled at 32.1 weeks of gestational age. Their mean (SD) age was 27.3 (6.2) years. In Table 1, it depicts the characteristics of the studied women. The mean (SD) of the parity was 2.2 (1.6), 3206 (55.7%) of them were Primigravidae. 2,960 (51.4%) of these women had less than secondary level education.

Table 1 General characteristics of the studied women

	17-21	22-26	27-31	32-36	>37
Primigravidae	109	1350	1013	513	221
Multi-gravidae	13	413	935	724	469

Table 2 Prevalence of hepatitis B and hepatitis C among pregnant women in Benin metropolis

Parity	HBsAg No. infected (%)	HBV
Primigravidae	353(49.0)	83(40.3)
Multi-gravidae	367(51.0)	123(59.7)

Table 3 Frequency of HBsAg & Anti HCV in different age groups of the pregnant women

Age (Years)	17-21	22-26	27-31	32-36	>38
HBsAg (%)	19(2.6)	70 (9.7)	203(28.2)	413(57.4)	15(2.1)
HCV (%)	35(17.0)	28(13.6)	46 (22.3)	75 (36.4)	22(10.7)

Table 4 Effect of risk factors on prevalence of hepatitis B and C

	P value Hepatitis B	P value Hepatitis C
Less than secondary school	0.7	0.9
History of jaundice	0.3	0.7
History of blood transfusion	0.5	0.5
Traditional scares	0.6	0.7
Tattooing	0.3	0.8
Dental maneuvers	0.8	0.3

HBsAg was detected in 720 (12.5%) out of 5,760 women. The mean (SD) of the age, parity and gestational age were not significantly different between the sero-positive and sero-negative women (data not shown). 206 (3.6%) out of 5,760 were found to be positive for hepatitis C. 33 (0.57%) had mixed infections of hepatitis B and C (Table 2).

The report of this study shows that 5040(87.5%) and 5554 (96.4%) were found to be sero-negative to serum antibodies to hepatitis B and C respectively as at the time of the study. The frequency of Hepatitis B and C was more in age group ranging between 32–36 years (Table 3).

In Table 4, it shows the results of the analysis of the effect of the expected risk factors. None of the expected risk factors (parity, history of blood transfusion, dental

manipulations, tattooing and circumcision) had been found to be associated with HBsAg sero-positivity.

Discussion

Infections due to Hepatitis B and Hepatitis C viruses (HBV, HCV) are significant health problems around the globe. Worldwide, viral hepatitis is the commonest cause of hepatic dysfunction in pregnancy. In our study, the frequency of Hepatitis B and Hepatitis C infections among antenatal patients attending the University of Benin Teaching Hospital was 12.5% and 3.6% respectively while 0.57 % was recorded for both HBV and Anti HCV. This also supports the WHO's report for Nigeria [12] as highly endemic area with prevalence greater than 8% for HBV.

The prevalence of HBV infection reported in this study was higher than the 4.9% and 10.3% reported in Port Harcourt and Jos, respectively [13, 14]. In contrast it was less than the 21.3% recorded in Ibadan [15], 23.9% and 15.1% in two studies in Jos [16, 17], and 17.1% among sex workers in Nasarawa state [18]. There was also a report of 18.2% and 7.3% prevalence among pregnant women in Zaria [19] and Kano [20] respectively, all in Nigeria. These differences might not be unconnected with the fact that some of the studies were not from the same risk group.

The anti - HCV antibody prevalence of 3.6% in this study was found to be much lower when compared with studies from Enugu, Jos and Kaduna with 14.9% [21], 5.2% and 11.9% [22] respectively. The prevalence of HCV infection in our study was found to be higher when compared to reports from South East Asia (2.15%), America (1.17%) and Europe (1.03%), but lower when compared with Eastern Mediterranean (4.6%), Western Pacific (3.9%) [23], and Egypt (20%) [24].

In a recent study, 2439 pregnant women were screened for Hepatitis B and Hepatitis C and 7.3% of them were positive for anti HCV, 2.2% for HBsAg and 0.08% were positive for both. These results are lower than ours but are similar to our findings of high rate of HCV [25].

In this study it was found that most of the patients fell within the 32–36 years age group followed by 27–31 years age group because this was the majority age group admitted to the antenatal clinic of the hospital. In our study most of the patients were found to be multi gravida patients. It might be at increased risk because of their past pregnancies, hospital admission blood transfusion and/ or any surgical procedure in the past. These findings were similar to the studies conducted by Awan *et al* and Ali *et al* [26, 27].

These variations, noticed between our study and other studies previously conducted may be related to the peculiarities in the modes of transmission of HBV and HCV dictated by socio-cultural practices environmental factors and also variety in methods. However, comparison between our study and the others' should be taken

cautiously because different methods had been applied, in our study we aimed to detect antibodies using ELISA, while some of these studies, DNA of these viruses had been detected rather than antibodies. Unlike the previous reports [28, 29, 30] none of the expected risk factors (age, parity and the other socio-demographic characteristics) for sero-positivity for HBV and HCV respectively had been identified in the current study. The explanations for such observations need to be explored in the future.

Conclusions

A total of 12.5% and 3.6% of the pregnant women studied were sero-positive for hepatitis B and C. Therefore, the need to institute public health measures to reduce disease burden and transmission, including routine screening of all pregnant mothers for HBV and HCV infections.

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