

## Some Risk Factors Associated with Seroprevalence of Hepatitis B and C Viral Infections Among Pregnant Women Attending Antenatal Care at Dalhatu Araf Specialist Hospital Lafia, Nasarawa State Nigeria.

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Received: 29-12-2020

Accepted: 05-01-2021

Published: 08-01-2021

**Abstract:** Hepatitis B and C viruses are major health problems worldwide, especially in Nigeria. The study was conducted among 374 pregnant women who went to an antenatal clinic at Dalhatu Araf Specialist Hospital Lafia, Nasarawa Province, Nigeria to find out what were the risk factors associated with seroprevalence for Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Blood samples tested for hepatitis B surface antigen (HBsAg) and Anti-HCV using HBsAg and Anti-

HCV are one step for rapid testing and in addition and the immunochromatographic procedure. The results showed 9.4% and 4.8% blood samples tested for HBV and HCV respectively. All pregnant women who participated in the study are married. Women from the one-man family had the highest rates of 9.5% HBsAg and 5.2% HCV followed by polygamy with 9.2% HBsAg and 4.3% HCV. Factors such as blood transfusions, previous history of hepatitis, contraceptive use, herbal remedies, alcohol use, and surgical history are all considered and are not essential to the spread of HBV and HCV infections. In some cases to prevent mother-to-child transmission, appropriate testing should be done during prenatal visits and immunizations should be given equally to an HIV-negative person.

**Keywords:** Risk factors, HBV, HCV, Pregnant women

**Introduction** The lines of transmission of HCV and HBV described in the literature are blood, blood products, tissues, and organs; unsafe medical procedure; health care exposure e.g. needlestick injury [1] (Xia et al, 2008); intravenous drug use (Tohme and Holmberg, 2010) [2]; sexual transmission (Jafari et al., 2010) [3]; body piercing (Lam et al., 2010) [4] and vertical transmission (Owusu-Ofori et al., 2005) [5]. In Africa, only 19% of blood is tested for HCV (anti HCV antibodies). The main reason for this low screen size is the unauthorized cost of laboratory testing (Jeannel et al., 1998) [6]. Also, incompatible screening procedures for blood donors make transfusions a great way to detect HCV infection. This is evidenced by the high increase in HCV in cell patients (17%) who have received large amounts of blood transfusions (Touzet et al., 2000) [7]. While the prevalence of HCV in intravenous drug users in the developed world reaches 80%, little is known about the prevalence of similar risk groups in Africa (Simonsen et al., 1999) [8]. However, Madhava et al found drug use is a rare form of HCV transmission in Africa (WHO, 1999) [9]. Although there are significant differences between countries, the WHO estimates that in sub-Saharan Africa, about 18% of injections given with recycled or non-injected needles thus increase the risk of transmission through unsafe injection practices (Gibb et

al., 2000) [10]. Direct transmission is low but important in determining the co-infection with HIV, a pandemic-like condition in Africa (Alter et al., 2007) [11]. There have been reports of widespread hepatitis in pregnant women in the nearby towns of Makurdi Benue State [12] and Nnewi [13] in Anambra state with little or no report in Lafia at Nasarawa State Capital

### Methodology

The study was conducted in Lafia, Nasarawa state capital among pregnant women attending antenatal care at DalhatuAraf Specialist Hospital Lafia. Nasarawa's state fondly called "Home of solid minerals" lies on an altitude of 181.5m above sea level.

**Study Population:** In this study, blood samples were collected from pregnant women receiving antenatal care at DalhatuAraf Specialist Hospital, Lafia. The pregnant women live in different areas of Lafia. The history of the studied population (i.e., pregnant women) was recorded on an exercise book approved by the hospital's ethical review committee. Informed consent was obtained from all patients and appropriate confidentiality was maintained throughout the study.

**Sample Collection:** Three hundred and seventy-four (374) samples were collected from pregnant women receiving maternity care at DalhatuAraf Specialist Hospital, Lafia. The age group included in this study was 15 - 39 years. 2 milliliters (2mL) of intravenous blood for each participant in venipuncture were collected, serum separator tubes were distributed, and centrifuge was pumped into the centrifugal force (RCF) of 1000-1500 revolutions for 5 minutes (rpm) for 5 minutes to obtain a clear serum beyond human capacity.

**Laboratory Analysis of HBV and HCV:** All the samples were screened for HBV and HCV infection based on the immunochromatographic technique (ICT). Immunochromatography (SD BiolineHbsAg) is a one-step assay designed for the qualitative determination of HbsAg and HCV in human serum or plasma in accordance with the manufacturer’s instructions. The test cassette contains a membrane strip that is pre-coated with mouse monoclonal anti-HbS capture antibody on the band region. The mouse monoclonal anti-HbS-colloidal gold conjugate and the serum sample move along the membrane chromatographically to the test region (T) and then form a visible line as the antibody-antigen-antibody gold particle complex forms. For the diagnosis of HCV infection immunochromatography, SD Bioline HCV test contains a membrane strip that is pre-coated with recombinant HCV captured antigen on the test band region. The protein A-colloid gold conjugate and the serum sample move along the membrane chromatographically to the test region and then form a visible line as the antigen-antibody protein A-gold particle complex forms with a high degree of sensitivity and specificity.

**Statistical Analysis**

The prevalence of each viral infection (HBV and HCV) was determined from the proportion of the positive individuals in the total population under consideration and was expressed as a percentage. A comparison of the frequency was analyzed using the Chi-square test and a P-value greater than 0.05 was considered statistically not significant.

**Ethical approval**

Ethical consent was sought from the hospital ethical committee. Informed consent was obtained from each participant prior to the commencement of the study.

**Results**

**Seroprevalence of Hepatitis B and C among Pregnant Women Based on Marital Status**

The seroprevalence of HBV and HCV among pregnant women based on marital status showed that all pregnant women used in the study are married and with a percentage prevalence of 9.4% and 4.8% for HBV and HCV respectively.

**Table 1: Seroprevalence of Hepatitis B and C among Pregnant Women Based on Marital Status.**

Marital status	Number tested	HBsAg Positive (%)	Anti-HCV Positive (%)
Married	374	35(9.4)	18(4.8)
Divorced	0	0(0)	0(0)
Widow	0	0(0)	0(0)
Total	374	35(9.4)	18(4.8)

**The Seroprevalence of Hepatitis B and C among pregnant women based on Family Background**

The seroprevalence of HBV and HCV among pregnant women based on family background showed that monogamy had the highest percent of 9.5% for HBsAg and 5.2% for HCV followed by polygamy which had the prevalence of 9.2% for HBsAg and 4.3% for HCV.

**Table 2: Seroprevalence of Hepatitis B and C among Pregnant Women Based on Family Background**

Family background	Number test	HBsAg Positive (%)	Anti-HCV Positive (%)
Monogamy	211	20(9.5)	11(5.2)
Polygamy	163	15(9.2)	7(4.3)
Total	374	35(9.4)	18(4.8)

**Seroprevalence of Hepatitis B and C among Pregnant Women Based on Associated Risk Factors.**

The seroprevalence of HBV and HCV among pregnant women based on associated risk factors has shown that pregnant women with a history of blood transfusion had 11.1% for HBsAg and 8.8% for HCV, those with a history of surgery had 9.8% for HBsAg and 14.6% for HCV, pregnant women that do use contraceptives had 11.5% for HBsAg and 8.9% for HCV, pregnant women with the previous history of hepatitis had 33.3% for HBsAg and 22.2% for HCV. Pregnant women that patronize herbal medicine had 9.8% for HBsAg and 9.3% for HCV, pregnant women that do take alcoholic drinks had 14.3% for HBsAg and 0% for HCV.

**Table 2: Seroprevalence of Hepatitis B and C among Pregnant Women Based on Associated Risk Factors**

Risk factors	Number Tested		HBsAg Positive Anti-HCV Positive (%)		p-value
	Yes	No	Yes (%)	Yes (%)	
Blood transfusion	45	329	5(11.1)	4(8.8)	0.060
History of surgery	41	333	4(9.8)	6(14.6)	0.072
Contraceptive use	78	296	9(11.5)	7(8.9)	8.211
Previous history of hepatitis	9	365	3(33.3)	2(22.2)	0.091
Herbal medicine use	214	160	21(9.8)	20(9.3)	2.077
Alcoholic consumption	14	360	2(14.3)	0(0)	0.361

## Discussion

Hepatitis is one of the important Public Health challenges and has not been given proper attention mostly in the tropics. HBV and HCV infections are contagious diseases and can be transmitted vertically and horizontally through fluids such as blood products and other risk factors. This study sought to determine some risk factors associated with the prevalence of Hepatitis B and C viruses amongst pregnant women. Marital Status: All the pregnant women examined were married and live with their spouses. This could be one of the reasons for the relatively low prevalence of 9.4% of HBV and 4.8% HBC observed in this study. During the period of this study, pregnant women who were either widow, divorced, or separated from their spouses or single mothers were not encountered. Studies have shown that mother to child transmission (vertical transmission) is one of the major routes of HBV and HBC transmission mainly in endemic countries like Nigeria, therefore, early recognition of HBV and HBC carrier pregnant women and treatment and vaccination will go a long way to reducing the perinatal HBV and HBC infections and their complications [14]. Family background: prevalence of HBV and HBC were highest amongst pregnant women in a monogamous family than the pregnant women in a polygamous family, this contradicts believe and insinuations that the people in a polygamous family are at higher risk of infection. However further studies is required to further verify this claim. In this study, 12% had a history of blood transfusion and of them, 11.1% and 4.8% were positive to HBV and HBC. The results observed in this study are lower than those reported in North West Etopia [15] which showed that history of blood transfusion was an independent risk factor for hepatitis B virus infection. However, this does not neglect the fact that Hepatitis viral infection spread easily via fluids such as blood.

In this study, only 2.4% of pregnant women have been previously screened for Hepatitis. Of them, 33.3 % and 22.2% were also infected which is relatively high. Most of the pregnant women used in this study were on unaware of perinatal transmission. Therefore, there is a need to intensify efforts on the awareness campaigns on HBV and HBC infections through the mother-child route. And the importance of routine screening and vaccination during antenatal. However, previous studies in Ethiopia [16] reported that none of the participants were previously screened. This study and an earlier study in Ethiopia [17] show some improvement as some of the pregnant women had previously been screened. On the history of surgery, the HBV and HBC infections recorded in this study were not dependent on the history of surgery, though an appreciable proportion of 9.8 % and 14.6% of HBV and HBC infections respectively were observed among pregnant women who have had a form of surgery or the other that participated in the study. This also suggests a public health risk if it is not checked. And the result from this study also calls for proper screening of the health care givers on the subject matter. Also, pregnant women that use contraceptives had a relatively lower infection compared to what was reported in a nearby town of Makurdi Benue State [12]. The prevalence reported in this study on pregnant women that use of herbal medicine is lower than that reported in Makurdi Benue State [12]. This suggests an improvement in the level of preparation of most of herbal medicines. However, proper health safety measures should be taken in other to drastically reduce such transmissions. In this study, pregnant women that consumed alcohol were equally infected, this was however higher than that observed in a previous study in Makurdi Benue State [12]

This study, therefore, suggests that HBV and HBC infections are of moderately endemic in Lafia, Nasarawa State Nigeria and those pregnant women remains a potential vehicle of transmission of the virus mainly to their unborn babies. More also the fact that a good number of the pregnant women did not show any identified risk factors, places their children at a high risk of HBV an HBC infection and developing chronic HBV and HBC infections. Universal screening of pregnant women for HBV infection and early passive and active immunization of infants born to HBV-infected women is strongly recommended. In addition, education of the population on modification of lifestyle and sexual behavior will help reduce sexual-related transmission [15].

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