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Identifying pregnancy risks complications due to maternal-fetal HBV and HCV at the Bertoua Regional Hospital in the East Region of Cameroon

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ABSTRACT

Results from a seven-year nationwide inpatient sample study demonstrate that HBV and HCV viruses are each associated with pregnancy complication. Maternal HBV or HCV carrier status is a cause for concern regarding both the course of pregnancy and the short-term perinatal outcomes. Previous data conflict regarding the association of chronic HBV and HCV with adverse pregnancy outcomes, according to investigator Bing Chen, who presented the findings at the American Association for the study of liver Diseases. The main aim of this study is to identify HBV/HCV pregnancy risks complications. This cross-sectional study at Bertoua Regional Hospital of Cameroon (June 2025-January 2026) aimed at identifying pregnancy risks complications due to maternal-fetal HBV and HCV at the Bertoua Regional Hospital in Cameroon of pregnant women attending the maternity unit. The majority of them (62%) were aged within (19-28). (86.20%) of the pregnant women who were tested positive had experienced low birth weight, (79.31%) have known preterm birth, (68.76%) had been admitted to the Neonatal intensive care unit while (65.51%) had children with congenital abnormalities, pregnant women having HCV were likely to develop risks complications like preterm birth, low weight birth due to the fact that HCV is generally associated with a higher risk of adverse pregnancy complications compared to HBV particularly regarding neonatal outcomes. However, data identifying maternal-fetal HBV and HCV pregnancy risks complications among pregnant women across both community and healthcare settings remain limited, pregnant women are sometimes unaware of their pregnancy risks in their conditions; hence the need of this research study which goes in straight line with the World Health Organization elimination goals on viral Hepatitis.

Keywords: *Identifying, Pregnancy,Risks complications, Maternal-fetal, Viral Hepatitis B and C, , Cameroon*

1. INTRODUCTION

HBV and HCV are acquired by contaminated blood product exposure, sexual activity or perinatal transmission. Although the prevalence of HBV is relatively low, in the US and generally with approximately 1 million Americans are chronically infected by HBV (Sorell MF et al 2009), it is more prevalent in East Africa (8%) (Ott JJ et al 2011), Southeast Africa and India 1 to 66% and Sub-Saharan Africa (8 to 12%) (Ott JJ et al 2011).

Globally, HBV and HCV cause chronic infections in 254 million and 50 million persons worldwide respectively and these diseases result in 1.1 million and 242.00 deaths annually respectively (WHO 2024). In developing countries like Asia and Africa, HBV and HCV infections are common (WHO 2016), the WHO reported that there were 1.2 million and 10 new cases of chronic HBV and HCV infections worldwide in 2022 respectively (WHO 2024). According to the WHO estimates between 3 and 4 million people acquired the disease annually with the majority of cases occurring in Africa (Schweitzer et al 2025) other evidence also showed that an estimated 7.1 million people are infected with HCV worldwide (Global Hepatitis Report 2017). Despite being highly contagious, HBV and HCV are still underdiagnosed and underreported in the majority of African countries (WHO 2013). Both HBV and HCV have the potential to be widespread and impact a variety of populations, such as those with HIV, healthcare professionals, the general population of blood donors, pregnant mothers and their children (Coppola N et al 2016). Numerous studies show that the prevalence of HBV and HCV in pregnant women is now seriously associated with public health (Pabsu R et al 2018). Mother-to-child transmission of HBV, which might be through intrauterine transmission is a common event and causes chronic infection of the virus (Zhao et al 2022). The seroprevalence of HBV among pregnant women in Ethiopia ranges from 4.5 to 7.9% which is indicative of an intermediate degree of endemicity for the virus (Umare A et al 2026). The seroprevalence of HCV, which ranges from 0.26 to 8.07% was shown to be lower than that of HBV in the majority of Ethiopian studies (Bafa TA et al 2020). The seroprevalence of HBV and HCV among pregnant women in Cameroon is high with studies reporting rates generally ranging from 5% to over 16% (Mbongue-Mikangue et al 2024). Childbearing women can potentially transmit HBV and HCV to their children, they transmit an infection to new-borns usually during birth following close contact. There is a higher likelihood of vertical transmission of infection from mothers to offspring in 4.6% and 1.6% of babies delivered to pregnant women with HBV and HCV infections respectively (Dagnew et al 2020). New-borns who are exposed to HBV will have almost 85-90% risk of developing chronic liver disease (Brian J.Mc Mahon et al 1990).

Preterm delivery, placental separation, vaginal bleeding, early rupture of the membranes and mortality are among the many issues that can arise from maternal infection with HBV and HCV during pregnancy (Reddick K, et al 2011). A significant risk of neonatal hepatitis is also linked to it, and this can result in liver cirrhosis and hepatocellular cancer in young adulthood (Zahran et al 2010), eventhough viral hepatitis screening is advised during routine ANC, it is not always effective in some healthcare facilities in Cameroon. Recent research showed that both the general population and healthcare professionals reported having little knowledge of the hepatitis virus and its risks complications

on pregnancy (Shiferaw F 2016). Therefore, this study aimed at identifying the pregnancy risks complications due to HBV and HCV of pregnant women attending antenatal classes at the Bertoua Regional Hospital, in other words, what knowledge do pregnant women have as far as HBV and HCV is concerned in their condition?

2. RELATED WORKS

Childbearing women can potentially transmit HBV and HCV to their children, they transmit an infection to new-borns usually during birth following close contact. There is a higher likelihood of vertical transmission of infection from mothers to offspring in 4.6% and 1.6% of babies delivered to pregnant women with HBV and HCV infections respectively (Dagnew et al 2020). New-borns who are exposed to HBV will have almost 85-90% risk of developing chronic liver disease (Brian J.Mc Mahon et al 1990).

A study showed that Preterm delivery, placental separation, vaginal bleeding, early rupture of the membranes and mortality are among the many issues that can arise from maternal infection with HBV and HCV during pregnancy (Reddick K, et al 2011). A significant risk of neonatal hepatitis is also linked to it, and this can result in liver cirrhosis and hepatocellular cancer in young adulthood (Zahran et al 2010), eventhough viral hepatitis screening is advised during routine ANC, it is not always effective in some healthcare facilities in Cameroon. Recent research showed that both the general population and healthcare professionals reported having little knowledge of the hepatitis virus and its risks complications on pregnancy (Shiferaw F 2016).

3. MATERIALS & METHODS

Inclusion criteria were Pregnant women aged of 19 years and above (58) who freely consented, and came for antenatal care visit at the maternity unit of the BRH, and had not been vaccinated against HBVwithin the study period; as well, the study excluded pregnant women less than 19 years and non-pregnant women. Those of them who had receive HBV vaccine at the period of the study were also excluded. The prospective health facility-based study setting was chosen because of the required study population of pregnant women who register for regular antenatal care visits. Moreover, data collected at a specific point in time was deemed adequate to establish a diagnosis of HBV virus, hence, justifying the choice of a cross-sectional study design, this is because testing for Hepatitis B and C virus has been made a routine test for all the pregnant women on their antenatal care visit at the Bertoua Regional Hospital and actually were free of charge during the study. A total of 400 pregnant women were consecutively sampled (non-probabilistic) registered for their visit during the study period and all were approached with a request and signed the informed consent to take part in the study, all of them gave their consent to participate in the study and they were consecutively enrolled to the study.

Participants were assigned codes for anonymity purposes, we used for HBV screening Diaspot HBsAg, these are step Hepatitis B Surface Antigen (HBsAg) test strip package insert and for HCV, Diaspot HCV virus anti-body (HCV-Ab) test strips. Those are immune-chromatographic strips for qualitative detection of antibodies and antigens. Their sensitivity and specificity are above 99% and 98% respectively. Results were disclosed to participants with proper counselling; all infected pregnant women were counselled on the disease and referred for proper specialization care while the non-infected were counselled for HBV vaccination.

Data were obtained using a well-structured questionnaire which was designed for the research and for laboratory analysis; questions elicited data to cover the objectives of the study, the questionnaire included seven sections, each focusing on a particular aspect to answer the research questions and gaps as well. The quantitative part of the questionnaire featured MCQ and Likert-scale questions allowing participant to rate their experiences, knowledge, feelings and attitudes. The questionnaires also included open-ended questions inviting participants to give other factors not mentioned. Frequencies (sums and percentages) were calculated for the socio-demographic factors and the different attitudes, feelings and practices towards HBV and HCV.

Tables displaying the frequency distribution for knowledge, attitude and practice towards HBV and HCV were entered into graph, each of the tables had frequencies for knowledge, maternal HBV/HCV preventive modes and practices, modes of transmission. Data were analyzed using Excel 2016 frequencies and percentages were determined.

4. RESULTS & DISCUSSION

[See Annex — Table 1: Socio-demographic information and prevalence rates among pregnant women attending ANC]

The results show that among the HBV/HCV women tested positive (29), (79.31%) of them experienced preterm birth in the past due to their conditions, (86.20%) experienced low birth weight of their babies, (65.51%) congenital abnormalities and (68.76%) of them were admitted to the NICU with their babies.

As results, we found out that pregnant women with HBV were significantly more likely to give birth to a baby born preterm (86.20%) and (79.3%) of the babies born to their positive mothers had a low birth weight (<2500g), (68.76%) were admitted to the NICU and (65.51%) of those babies had congenital abnormalities; HBV and HCV infections during pregnancy are linked to significant maternal and fetal complications including increased risks of preterm birth, low birth weight, gestational diabetes and intrauterine restriction. (Statpearls-NIH 2025) confirmed HBV/HCV increase risks of preterm birth, placental issues and prenatal mortality and maternal HCV is strongly associated with preterm birth, with up to a two-fold increased risks of NICU admission and this in straight line with our findings in which HBV pregnant women are more likely to give birth to a baby born preterm (86.20%). Another study is that of (He et al 2023) which demonstrated that HBV is an independent risk factor for preterm birth and gestational diabetes, HBV infection is associated with an increased risk of GDM, even after adjusting for traditional factors like age and BMI, this is in phase with phase with our study whose results showed that 58.62% of pregnant women living with HBV/HCV are at a higher risk of developing gestational diabetes; our results found that 68.76% of babies born to either HBV/HCV mothers admitted to NICU at birth, this is in phase with the study of (Thakur HS et al 2017)

in which 27.27% of pregnant women had their babies admitted to NICU. Also, 65.5% of our HBV/HCV pregnant women were likely to give birth to a baby with congenital abnormalities as it was the case in the study of (Shiyao et al 2019) in which the results showed that pregnant women with HBV infection might be associated with a higher risk of congenital abnormalities.

5. CONCLUSION

Maternal-fetal HBV and HCV infections significantly increase the risk of adverse obstetric and neonatal outcomes, including preterm birth, low birth weight, gestational diabetes, and miscarriage. Chronic HBV infection poses a high risk of vertical transmission, particularly with high maternal viral loads, necessitating timely antiviral therapy.

While HBV has established protocols for preventing transmission, further research is needed to better understand the mechanisms of adverse pregnancy outcomes and to optimize the management of HCV in pregnancy.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest in relation to this work.

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ANNEXES

Annex I — Table 1: Socio-demographic information and prevalence rates among pregnant women attending ANC

Variables					
Age	(19-28)	(29-38)	(39-48)	(49-58)	-
n	248	82	62	8	-
%	62%	20.5%	15.5%	2%	-
Marital status	Single	Married	Divorced	Widow	-
n	238	112	33	17	-
%	59.5%	28%	8.25%	4.25%	-
Education level	No formal education	Primary school	Secondary school	College	Postgraduate
n	130	122	84	49	15
%	32.5%	30.5%	21%	12.25%	3.75%
Occupation	Housewife	Business	Framing	Government employed	-
n	155	135	68	42	-
%	38.75%	33.75%	17%	19.5%	-
Religion	Christian	Muslim	_	_	-
n	358	42	0	0	-
%	89.5%	10.5%	0%	0%	-
Gravidity and parity	First pregnancy	More than one pregnancy	-	-	-
n	95	305	-	-	-
%	23.75%	76.25%	-	-	-

Annex II — Table 2: HBV/HCV positive mothers experienced pregnancy risk complications percentage

Hepatitis B and C pregnancy risk complications	Preterm birth	Low birth weight	Congenital abnormalities	NICU
Yes	23	25	19	20
n				
%	79.31%	86.20%	65.51%	68.76%
No				
n	6	4	10	9
%	20.69%	13.79%	34.49%	31.24%