KESMONDS INTERNATIONAL UNIVERSITY
Entrepreneurial & Skilled Education for the Future
IQ RESEARCH JOURNAL
www.iqresearchjournal.com
KESMONDS RESEARCH INSTITUTE

Volume 5, Issue 2 - MAY 2026

IQ RESEARCH

A Quaterly Journal

ISSN: 2790-4296 (Online)
ISBN: 978-9956-504-74-9 (Print)
Published by IQRJ publications
www.iqresearchjournal.com

Entrepreneurial Education for a Changing Society

IQ RESEARCH JOURNAL
www.iqresearchjournal.com

KESMONDS RESEARCH INSTITUTE

EDITORIAL BOARD

Table of Contents

Entrepreneurial Education for a Changing Society

IQ RESEARCH JOURNAL
www.iqresearchjournal.com

KESMONDS RESEARCH INSTITUTE

Original Article IQRJ: Volume 005, Issue 002, May 2026 www.iqresearchjournal.com

Received : 20/02/2026___Revised : 20/04/2026___Accepted : 30/04/2026___Published : 02/05/2026

Identifying Risk factors of viral Hepatitis B and C among pregnant women at the Bertoua Regional Hospital in the East Region of Cameroon

Tatiana Jiengoué[a], Olivier Lieuga[a] and Augustine Nji Asakizi[a]

Affiliations

a. [a] School of Health and Biomedical Sciences, Kesmonds International University of America

Corresponding Author:

Tatiana Jiengoué Tchakonang
Email: jiengouetatiana@kesmondsuniversity.org

Paper ID: IQRJ-V05I02-26005012

ABSTRACT

Chronic viral Hepatitis B virus (HBV) and Hepatitis C virus (HCV) remain a significant global public health problem and a major cause of liver-related morbidity and mortality in Central Africa with high endemicity among pregnant women in Central Africa. Both Hepatitis B and C can cause acute and chronic infections and are leading cases of liver cirrhosis and hepatocellular carcinoma. During pregnancy, screening for hepatitis B and C is crucial because both viruses can be transmitted from mother-to-child, with HBV being more prevalent than HCV, and both infections posing risks for mother-to-child transmission. But, HBV transmission is largely preventable with post-birth imunoprophylaxis (vaccine + HIBG), while HCV transmission is less efficient but potentially treated with antivirals to prevent vertical spread. This cross-sectional study at Bertoua Regional Hospital Cameroon (June 2025-January 2026) aimed at identifying the risks factors of viral Hepatitis B and C among 400 pregnant women attending the maternity unit, the majority of them (62%) were aged within (19-28). Hospitalization (75.75%) was the main risk factor of viral Hepatitis B and C, followed by alcohol (72.25%) and blood transfusion (58.25%). However, data identifying risks factors across both community and healthcare settings remain limited, hence the need of this research The findings align with the World Health Organization as well as others organisms fighting for the elimination of viral Hepatitis such as the Centre of Disease Control and Prevention.

Keywords: *Risks factors, Viral Hepatitis B and C, Pregnant women, Cameroon*

1. INTRODUCTION

Blood-borne pathogens, Hepatitis B virus (HBV) and Hepatitis C virus (HCV) remain a significant global public Health challenges contributing substantially to the burden of infectious diseases worldwide. Globally, over 254 million and 50 million people are estimated to be chronically infected with HBV and HCV, respectively. According to the *(WHO 2024)*, Global Hepatitis report, Viral Hepatitis causes approximately 1.3 million deaths annually, ranking as the second leading infectious cause of death, comparable to tuberculosis.

Hepatitis B and C viruses are hepatotropic viruses responsible for the majority of viral hepatitis-related morbidity and mortality. Chronic infection can lead to liver cirrhosis, hepatocellular carcinoma (HCC), liver failure, and premature death: both viruses share similar transmission reuse of contaminated sharps, sexual contact, household exposures, and unsafe medical practices. Despite the availability of effective HBV vaccine, HCV remains non-vaccine preventable, and a substantial proportion of infected individuals remain undiagnosed and untreated worldwide. Hepatitis B virus causes a common Public health problem in Cameroon and across Sub-Saharan Africa *(Abongwa L.E. et al 2015).* In Uganda, antenatal education was recommended because most pregnant women showed excessively low knowledge and misconceptions about HBV *(Nyanka-Mutyoba et al 2018*).

Cameroon bears a significant burden based on the recent data, the Far North Region (specifically areas like Tokombéré and Mokolo) is a primary hotspot for high endemicity of HBV among pregnant women in Cameroon with prevalence rates exceeding 10% while HCV shows a prevalence rate of 1.8% to 7.3%, where endemic transmission persists. This cross-sectional study at Bertoua Regional Hospital among the 400 pregnant women as participants reported identified risk factors as follows: hospitalization, blood transfusion, dental and surgical history, alcohol, sexual transmitted diseases, liver family history, tattoo or piercing history, household contact and partners' history, conform with prior studies *(Eyong E.M. et al 2019).* Others significant risk factors were found to be involved in sexual activities below 19 years of age, history of multiple sex partners, and sexually transmitted infections *(Rabiu K.A et al 2010).* Likewise, expected risk factors were found to have no significant outcome in a study with HBsAg prevalence of 12.5% *(Ugbebor O. et al 2011)*. The findings align with the World Health Organization as well as others organisms fighting for the elimination of viral Hepatitis such as the Centre of Disease Control and Prevention. The main objective of this article is to identify the risks factors of viral Hepatitis B and C amongst pregnant women attending the Bertoua Regional Hospital, in other words, and knowing that Hepatitis is a communicable and infectious disease, what are the factors that predisposed pregnant women attending the Bertoua Regional Hospital to Hepatitis B and C?

2. RELATED WORKS

Although risk factors were not found to be significantly associated with HBsAg positivity among pregnant women in the Buea Health District in Cameroon, HBV in pregnant women has been associated with the risk of mother-to-child-transmission (MTCT), with the high prevalence (9.7%) of HBsAg, there was equally a higher chance of MTCT molecular Resistance Mechanisms in African Isolates. Hepatitis B virus causes a common Public Health problem in Cameroon and across Sub-Saharan *Africa*

(Abongwa L.E. et al 2015). In Uganda, antenatal education was recommended because most pregnant women showed excessively low knowledge and misconceptions about HBV, Studies have reported a significant relationship between knowledge on the transmission/prevention of HBV and the spread of the infection *(Nyanka-Mutyoba et al 2018).*

In 2017, a meta-analysis of *(Bigna JJ, Amougou et al 2017)* studied the seroprevalence of HCV in infections in Cameroon, the results showed that the prevalence was higher in the East region, in rural settings, and when using an enzyme immuno-assay technique for detecting anti-bodies HCV, there are still no data on HBV and HCV among pregnant women in that region, hence fostering the need to study the identification of the risk factors of HBV and HCV among pregnant women attending the antenatal care unit of the Bertoua Regional Hospital.

In the study of (Noubissié et al; 2023), The prevalence of hepatitis was 8.4%. Fifty-three percent (64) of the participants had adequate knowledge of Hepatitis B. Having had more than one sexual partner in the last six months and having visited a dentist in the past was significantly associated with Hepatitis B positive status.

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 amongst pregnant women attending ANC]

The results showed that the majority of pregnant women (62%) were aged within the framed age (19-28), most of them (59.5%) were single, (32.5%) of the pregnant women had no formal education, while (38.75%) of them were housewives, (89.5%) were Christian and more than half (76.25%) were multigravida that is they were pregnant more than once.

[See Annex — Table 2: Risks factors of HBV and HCV among pregnant women]

The findings showed that pregnant women having a hospitalization history are more likely to develop Hepatitis, that is hospitalization (75.75%) was the main risk factor of Viral Hepatitis among the pregnant women attending the Antenatal care visit at the Bertoua Regional Hospital, followed by alcohol history (72.25%) and blood transfusion history (58.25%), dental History (50.75%), multiple sexual partners (49.75%), surgical history (41.5%), sexually transmitted diseases (29.5%), liver family history (19.75%), Household contact (15.25%), and Piercing/tattoo history (11.25%).

The results showed that pregnant women having a hospitalization history are more likely to develop Hepatitis, that is hospitalization (75.75%) was the main risk factor of Hepatitis B and C among the pregnant women attending the Antenatal care visit at the Bertoua Regional Hospital, followed by alcohol history (72.25%) and blood transfusion history (58.25%). A similar study was conducted in the Loum Health District and we had the following results: (94.4%) of the pregnant women had a blood transfusion history, that is, the main risk factor among the pregnant women was blood transfusion history; followed by family household contact (91.3%) (Ngwanjoh et al 2022). In another study, 95% of pregnant women suffered from sexually transmitted infections like syphilis and it was considered a major risk (95%) for Hepatitis (Mawouma et al 2022).

Blood transfusions are important because they are a lifesaving medical treatment used to replace blood lost from injuries or surgery, or to treat conditions where the body can't produce enough healthy blood cells; while hospitalization is for serious or life-threatening medical conditions like heart attacks, scheduled procedures, and other illnesses that cannot be managed at home or in an outpatient setting; the majority of pregnant women has been blood transfused or hospitalized at least once in their lives: blood transfusion (58,25%), and hospitalization (75,25%), those viral Hepatitis risk factors actually predisposed those pregnant women attending the maternity unit of the Bertoua Regional Hospital to Hepatitis B and C.

Hence, fostering the urgent need of Hepatitis B and C prevention.

5. CONCLUSION

In conclusion, viral Hepatitis B and C among pregnant women is a real public health problem, women have to be sensitized and counselled. Viral Hepatitis screening routine has to be systematic as stated by the World Health Organization; unawareness is the main cause of high prevalence rate. As well, healthcare workers have to be conscious while operating on a daily basis, they must observe hygiene, as well as the using of safe objects for individual medical interventions so as to avoid contamination risks. Hepatitis has several risks factors as mentioned above. In our results, we found out that in the Bertoua Regional Hospital, Blood transfusion (75.75%) was the main risk factor of viral Hepatitis B and C; so efforts should be done so as to sensitize pregnant women at large and more especially the younger one about the negative consequences of Hepatitis B and C viruses on her pregnancy as well as her unborn baby in order to avoid or reduce the spread of the Hepatitis B and C viruses.

REFERENCES

Alter et al (1976). Type B hepatitis: the infectivity of blood positive for e antigen and DNA polymerase after accidental needle stick exposure, N. Engl. J. Med, 295,909-913.

Anaedobe et al (2015). Prevalence, Socio-Demographic Features and Risk Factors of Hepatitis B Virus Infection among Pregnant Women in South-western Nigeria. The Pan African Medical Journal, 20, 406.

Ansari, et al (2023). Risk of early horizontal transmission of hepatitis B virus in children of uninfected mothers in sub-Saharan Africa: A systematic review and meta-analysis. Lancet Glob. Health 2023,

Cabot B, et al (1997). Structure of replicating hepatitis C virus (HCV) quasispecies in the liver may not be reflected by analysis of circulating HCV virions. J Virol71:1732–1734.

Delamare, H. et al (2024). Proportion of pregnant women with HBV infection eligible for antiviral prophylaxis to prevent vertical transmission: A systematic review and meta-analysis. JHEP Rep. 2024, 6, 101064.

Di Filippo Villa, et al (2023) D.; Navas, M.C. Vertical Transmission of Hepatitis B Virus-An Update. Microorganisms 2023, 11, 1140.

Ducancelle et al. (2013) High Endemicity and Low Molecular Diversity of Hepatitis B Virus Infections in Pregnant Women in a Rural District of North Cameroon. PLoS ONE, 8, e80346.

European Centre for Disease Prevention and Control (ECDC) (2022) Introduction to the Annual Epidemiological Report. In: ECDC. Annual epidemiological report [Internet]. Stockholm: ECDC; 2022

European Paediatric Hepatitis C Virus Network. (2005). A significant sex-but not elective cesarean section-effect on mother-to-child transmission of hepatitis C virus infection. J Infect Dis192:1872–1879.

Fomulu, et al. (2013). Prevalence, Correlates and Pattern of Hepatitis B among Antenatal Clinic Attenders in Yaoundé-Cameroon: Is Perinatal Transmission of HBV Neglected in Cameroon? BMC Pregnancy and Childbirth, 13, 158.

Honegger JR, et al (2013). Loss of immune escape mutations during persistent HCV infection in pregnancy enhances replication of vertically transmitted viruses. Nat Med19:1529–1533.

Joshi, et al (2020). Presence of Precore (C)/C Promoter Mutants in Peripheral Blood Mononuclear Cells of Chronic Hepatitis B (CHB) Carriers During Pregnancy Does Not Correlate with Increased Risk of Liver Disease in 4 Years of Follow-Up. Dig. Dis. Sci. 2020, 65, 204–214.

Labarga P, et al (2007). Infant of 22 months of age with no anomalies born from a HCV- and HIV-infected mother under treatment with pegylated interferon, ribavirin and antiretroviral therapy during the first 16 weeks of pregnancy. Reprod Toxicol24:414–416.

Larouche A, et al (2012). Seronegative hepatitis C virus infection in a child infected via mother-to-child transmission. J Clin Microbiol50:2515–2519.

Law M, et al (2008). Broadly neutralizing antibodies protect against hepatitis C virus quasispecies challenge. Nat Med14:25–27.

Li C, et al (2020). Impact of maternal HIV-HBV coinfection on pregnancy outcomes in an underdeveloped rural area of southwest China. Sex Transm Infect. 2020 Nov;96(7):509-515.

Liu, J.F. et al (2021). Vertical transmission of hepatitis B virus: Propositions and future directions. Chin. Med. J. 2021, 134, 2825–2831.

Liu, Z et al (2022). Management Algorithm for Prevention of Mother-to-child Transmission of Hepatitis B Virus J. Clin. Transl. Hepatol. 2022, 10, 1004–1010.

Papaevangelou Vet al (1998). Increased transmission of vertical hepatitis C virus (HCV) infection to human immunodeficiency virus (HIV)-infected infants of

HIV- and HCV-coinfected women. J Infect Dis178:1047–1052.

Platt L et al (2020). Prevalence and burden of HBV co-infection among people living with HIV: A global systematic review and meta-analysis. Journal of Viral Hepatitis. 2020.

Schillie S, et al (2020). CDC Recommendations for hepatitis C screening among adults—United States, 2020.

Sede M, et al (2014). Inter and intra-host variability of hepatitis C virus genotype 1a hypervariable envelope coding domains followed for a 4–11 year of human immunodeficiency virus coinfection and highly active antiretroviral therapy. Virology471-473: 19–28.

Wang F, et al (2017). Post-vaccination serologic testing of infants born to hepatitis B surface antigen positive mothers in 4 provinces of China. Vaccine. 2017;35(33):4229–35.

Wang W, et al (2020). Dual-targeting nanoparticle vaccine elicits a therapeutic antibody response against chronic hepatitis B. Nat Nanotechnology. 2020; 15:406–16

Wong, et al (2023). Real-world treatment outcome with protease inhibitor direct-acting antiviral in advanced hepatitis C cirrhosis: a REAL-C study Hepatol Int. 2023/

World Health Organization (2016). global health sector strategy on viral hepatitis 2016–2021: towards ending viral hepatitis. Geneva: World Health Organization; 2016 (http://apps.who.int/iris/bitstream/10665/246177/1/WHO-HIV-2016.06-eng.pdf?ua=1, accessed 2 April 2020).

World Health Organization (2017). Elimination of mother to child transmission of HIV and syphilis. Geneva.

World Health Organization, (accessed on 11 May 2025). Hepatitis C Available online: https://www.who.int/news-room/fact-sheets/detail/hepatitis-c.

World Health Organization; (2015). Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection. Geneva: (http://apps.who.int/iris/bitstream/10665/154590/1/9789241549059_eng.pdf? ua=1&ua=1, accessed 20 March 2020).

Zou H et al (2012) Virologic factors associated with failure to passive-active immunoprophylaxis in infants born to HBsAg-positive mothers. J Viral Hepat. 2012 Feb;19(2): e18-25

CONFLICTS OF INTEREST

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

HOW TO CITE

Tatiana Jiengoué, Olivier Lieuga and Augustine Nji Asakizi (2026). Identifying Risk factors of viral Hepatitis B and C among pregnant women at the Bertoua Regional Hospital in the East Region of Cameroon. IQ Research Journal, 5(2), IQRJ-V05I02-26005012. www.iqresearchjournal.com

ANNEXES

Annex I — Table 1: Socio-demographic information amongst 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	0
%	38.75%	33.75%	17%	19.5%	0%
Religion	Christian	Muslim	_	_	-
n	358	42	-	-	-
%	89.5%	10.5%	-	-	-
Gravidity and parity	First pregnancy	More than one pregnancy	-	-	-
n	95	305	-	-	-
%	23.75%	76.25%	-	-	-

Annex II — Table 2: Risks factors of HBV and HCV among pregnant women

Variables	Yes		No	
	n	%	n	%
Blood transfusion History	233	58.25%	99	24.75%
Hospitalization history	303	75.75%	97	24.25%
Surgical history	166	41.5%	234	58.5%
Dental history	203	50.75%	197	49.25%
Alcohol history	289	72.5%	111	27.75%
Liver family history	79	19.75%	321	80.25%
Piercing/tattoo history	45	11.25%	355	88.75%
Multiple sexual partners	199	49.75%	201	50.25%
Sexually transmitted diseases	118	29.5%	282	70.5%
Household contact	61	15.25%	339	84.75%