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Pregnant women awareness of HBV and HCV maternal-fetal preventive measures at the Bertoua Regional Hospital in the East Region of Cameroon

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ABSTRACT

HBV virus is preventable through vaccination, however, pregnant women are at increased risk of HBV transmission due to high viral load. HCV does not have vaccine but its prevention requires strict avoidance of blood-to- blood contact. The most effective methods include never sharing needles, or drug equipment for tattoos/piercing, not sharing personal items like razors or toothbrushes and practicing safe sex. HCV Pregnant women can transmit the virus to their babies during pregnancy, labor, delivery or breastfeeding. This study aims to assess pregnant women awareness of preventive measures of maternal -foetal HBV and HCV at the Bertoua Regional Hospital. This was a cross-sectional study at Bertoua Regional Hospital of Cameroon (June 2025-January 2026) among 400 pregnant women attending the maternity unit. the majority of them (62%) were aged within (19-28), (69.5%) of the pregnant women were aware of the Hepatitis B vaccine as means of prevention, while only (6.5%) of them completely ignored their Hepatitis B vaccine status. (46.75%) of the pregnant women alleged that vaccination is the main mean of HBV prevention and (50.5%) of them said wearing gloves is the HCV best mean of prevention. However, data describing and evaluating the pregnant womens knowledge of HBV and HCV preventive measures among pregnant women 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 prevention and elimination of viral Hepatitis such as the Centre of Disease Control and Prevention.

Keywords: *Assessing, Efficiveness, Viral Hepatitis B and C, Maternal-fetal, Preventive measures Cameroon*

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1. INTRODUCTION

Viral Hepatitis B remain a public health problem in Sub-Saharan Africa, where maternal-fetal transmission represents a major route of infection prevention. This transmission is essential to achieving the WHO's 2030 virus elimination goals. HCV virus infection is a common infectious disease that affects the liver and remains a significant global health burden (NIH 2002). Viral Hepatitis B is a serious health problem, responsible for 83% of the 1.3 million deaths related to viral hepatitis in 2022 according to the (Global Hepatitis Report 2024) Africa bears a heavy burden of this morbidity and mortality through the development of cirrhosis and hepato cellular carcinoma at an early age (Spearman, CW at al 2017). This health threat calls into question the effectiveness of the response led by the WHO since 2016 with a view of eliminating this disease by 2030 (WHO 2024). HBV can be transmitted vertically from a mother to her baby during childbirth (Riches N et al 2025), horizontally, by unprotected sexual contact with HBV infected individuals (Di Filippo Villa D et al 2023) or parenterally through percutaneous or mucosal exposure to HBV infected blood and /or body fluids (Caminada et al 2023).

Therefore, groups of people are at increased risk for HBV infection (Bhattacharya H, et al 2025) including people who have unprotected sex with infected partners, pregnant women with HBV infection, people who share needles or syringes and healthcare workers (Eshwarik et al 2022). Since 2009, the World Health Organization has recommended the HBV birth-dose vaccine, preferably within 24h. However, in most countries, in Africa, the HBV vaccine is part of pentavalent vaccine and is administered starting at 6-8 weeks of age (Nguwoh P.S et al 2024). In

Cameroon, the HBV vaccine has been included in the national immunization program with the prevention of the combination vaccines administered to infants at 6, 10 and 14 weeks of age (Nguwoh et al 2024). Although this early vaccination provides essential protection, Cameroon still faces a high burden of HBV infection, with an essential prevalence rate of 6-11% healthcare workers and vaccination response rates of 11%-13% (AKAZONG E, W et al 2021). Thus, the prevention of maternal-fetal transmission of HBV represents a key strategy for the elimination of Hepatitis B as a public health threat by 2030 (WHO 2024). In this regard, systematic screening of pregnant women, early access to treatment and vaccination at birth represent the tripod of maternal-fetal prevention (WHO 2024). We therefore assess the awareness and knowledge of maternal-fetal HBV and HCV preventive measures at the Bertoua Regional Hospital of Cameroon.

2. RELATED WORKS

Recent studies on HBV and HCV in Cameroonian pregnant women show high endemic prevalence (greater than 5%) indicate that while vaccination exists, maternal-fetal prevention is hampered by low screening rates (15.6% in some districts) and delayed birth-dose vaccination. A study of (Yusuke et al 2022) found that timely (<24H) HBV-birth-dose vaccination significantly reduce risk, but delays increase HBsAg positivity in children. Another Cameroonian study of (Fadel Medjou et al 2025) highlighted a high HBV prevalence (greater than 8%) but low screening rates (15.61%) in Djoungolo Health District.

The study of (Fouelifack et al 2018) noted lower Hepatitis C (HCV) prevalence (1.6% to 1.8%) compared to HBV, focusing on the need for

combined screening strategies during ANC. Hepatitis B vaccination among pregnant women is low <2.5% despite high risk.

The recommendation for neonatal HBV vaccination and antiviral therapy, particularly tenofovir disoproxil fumarate (TDF) starting at 28 weeks of pregnancy for high-risk mothers, is supported by a systematic review and meta-analysis by the World Health Organization (WHO) and further investigated in studies like the one published in JAMA by (Pan *et al.* in 2024). These works, along with others by authors like Wong, Pai, and Yoshida, demonstrate the efficacy of this approach in preventing mother-to-child transmission of hepatitis B.

Several studies have investigated Hepatitis B (HBV) vaccine dose completion, (Kimera *et al* 2024.) and a study by (Sheikh *et a* 2023l.) in Open Forum Infectious Diseases, which specifically focused on delays in completion for people with HIV. Another study by (Bruxvoort *et al*, 2020) looked at completion rates in U.S. adults.

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 HBV within 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 among 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.

[See Annex — Table 2: Hepatitis B vaccine awareness and completion percentage]

While (30,5%) of the pregnant women had no knowledge about hepatitis B vaccine, as well, (69,5%) and (6,5%) respectively had knowledge about hepatitis B vaccine and knew their HBV vaccination status; also, only (12,25%) had completed all their HBV vaccination doses, while (49%) had not completed theirs. HBV vaccination is the surest and premium means of HBV prevention,

[See Annex — Table 4: Hepatitis Screening and screening importance percentage]

Nearly all the pregnant women (91,75%) were unaware of the neonatal HBV vaccination and (78%) the antiviral therapy at 28 weeks, only (8,25%) were aware of the neonatal vaccination and (22%) for that of antiviral therapy at 28 weeks.

Preventing mother-to-child transmission (MTCT) of HBV involves universal maternal screening, antiviral prophylaxis (e.g., tenofovir) for high-viral-load mothers from week 28, and infant immunoprophylaxis (HBIG + vaccine) within 12 hours of birth, preventing >95% of

cases. For HCV, universal screening is recommended, but no vaccine exists, and breastfeeding is safe unless nipples are damaged. According to our results, (69.5%) of the pregnant women are aware of HBV vaccination, but only (6.5%) of them knew their HBV vaccination status, nevertheless, (46.75%) of them recognized that HBV vaccine is the most effective to prevent HBV infection. A study of (Huang XX et al 2023) concluded that to prevent Mother-to-child-transmission of Hepatitis B, it is necessary to standardize the treatment of pregnant women with a high exposure of Hepatitis B, implement combined vaccination within 12 hours of birth and standardize the full course of Hepatitis B;

A study stipulated that in the absence of preventive measures, the probability of transmission from mother to child varies from 70% to 90% for women with a high HBV viral load (or who are HBeAg-positive), and from 10% to 40% for moms who are HBeAg negative. Even among newborns who receive the hepatitis B vaccine, high maternal quantities of HBV DNA (viral load) are linked to an increased risk of transmission. (Emily Henderson 2021). Hepatitis C virus (HCV) transfer from mother to child is rather rare. Antibody to HCV (anti-HCV) is found in 0.1 percent to 2.4 percent of pregnant women, while it is significantly higher in some endemic areas. The percentage of women with anti-HCV who have active viremia infection varies between 60% and 70%. (Emily Henderson 2021). In general, vertical transmission of HCV is thought to be a risk only for women with detectable HCV RNA during pregnancy. The meta-analysis by (Benova et al) included 15 studies with a total of 473 children born to women who were HCV-antibody-positive but RNA-negative. Only 1 of

the 473 children was diagnosed with vertically acquired HCV infection.

5. CONCLUSION

In conclusion and regarding our results, we noticed that Hepatitis among pregnant women at the Bertoua Regional Hospital had a lower awareness of HBV and HCV of maternal-foetal preventive measures, it still need some adjustments namely campaign sensitization about viral hepatitis B and C, recruitment of trained personnel in Hepatology within the hospital, effective communication and information of pregnant women, counselling through antenatal classes

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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 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	Farming	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: Hepatitis B vaccine awareness and completion percentage

Hepatitis B awareness	Yes	No	-	-
N	278	69.5%	-	-
%	12.2%	30.5%	-	-
Hepatitis B vaccine completion	Yes, completed	Yes, but not completed	No	I don't know
N	49	196	84	71
%	12.5%	49%	21%	17.75%

Annex III — Table 3 : Hepatitis Screening and screening importance percentage

Hepatitis B and C screening	Yes	No	I don't know
N	265	106	29
%	66.25%	26.5%	7.25%

Annex IV — Table 4: Neonatal vaccination program at 28 weeks of pregnancy awareness

Hepatitis B and C screening importance	Yes	No	Unsure
N	378	12	10
%	94.5%	3%	2.5%