

# Prevalence, Knowledge and Risk Factors of Hepatitis B Among Pregnant Women in the Loum Health District, Cameroon

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**Abstract:** Infection with Hepatitis B virus continues to be an important global public health problem with millions of people worldwide affected. Around 2 billion people have been exposed to hepatitis B globally, and about 257 million people are living with hepatitis B particularly in the Low and Middle-income countries. Cameroon is endemic and pregnant women are rarely screened routinely in most health facilities in Cameroon. The objective of this study was to determine the prevalence, knowledge and risk factors of hepatitis B among pregnant women in Loum Health District. This study was a cross sectional hospital and community-based carried out among pregnant women in the Loum Health District. All the 5 health areas and 24 health facilities were included. Data on the socio demography and knowledge on hepatitis B infection was collected using a structured questionnaire. Pregnant women were screened for hepatitis B surface antigens (HBsAg) using the DiaSpot One Step Hepatitis B test. Data was analyzed using SPSS version 26. The Chi square test was used to compare proportions and the logistic regression model was fitted to find out factors independently associated with knowledge, prevalence and attitude. Of the 200 pregnant women screened, 18 (9%) were positive for hepatitis B virus. Higher prevalence was observed for the age group 16-25 (10.8%) and primary level of education 7 (13.5%). The results showed that pregnant women had inadequate knowledge on HBV infection. History of multiple sex partners (AOR=5.58, P=0.001), history of surgery (AOR=3.04, P=0.026) and history of tattooing (AOR=2.36, P=0.041) were all significantly associated with hepatitis B sero-positivity. The prevalence of HBsAg was 9% with only one third of participants having adequate knowledge on Hepatitis B. Although hepatitis B is recognized to be one of the major health problems, pregnant women in the Loum health district were less aware of its mode of transmission, consequences and prevention. History of surgery, tattooing, multiple sexual partners were factors that increase hepatitis transmission. Compulsory screening of pregnant women in hospital and health educative talks on Hepatitis B during antenatal visit could create more awareness among pregnant women.

**Keywords:** HBV Infection, HBsAg, Risk Factors, Pregnant Women

## 1. Introduction

Infection with hepatitis B is a major public health issue globally with millions of new infections every year and consequent disability and fatality [1, 2]. Around 2 billion people have been exposed to hepatitis B globally, and about 257 million people are living with hepatitis B (that is being

positive for hepatitis B surface antigen (HBsAg)) particularly in the low and middle income countries [3]. In 2015, 887000 deaths resulted from Hepatitis B infection, mostly due to liver complications particularly liver cirrhosis and hepatocellular carcinoma. Transmission of Hepatitis B can be either vertical, from a mother to her unborn child in-utero or horizontal, from one person to another via blood and other

body fluids sourced from blood. Globally, prevalence of hepatitis B in adults is greatest in the WHO Western Pacific Region (6.2%) and the WHO African region (6.1%). In Sub Saharan Africa, the overall HBsAg positivity rate in the general population is 5%–20%, and perinatal transmission estimated at only 1%–5% [7, 8]. Approximately, 65 million individuals chronically infected with HBV live in Africa [9]. Studies done in Cameroon reveal that the prevalence rates of HBV are as high as 10.1%–12.1% among blood donors in hospital banks. Hepatitis B prevalence among pregnant women does not differ much from the prevalence in the general population [5]. Frambo et al. and Fomulu et al. have both reported prevalence of 9.7% and 7.7% among pregnant women, respectively [9].

When a child is born to a mother who is positive for both hepatitis B surface antigen (HBsAg) and hepatitis B electron antigen (HBeAg), they have a 70–90% chance of acquiring the infection from the mother and up to 90% of these infections from mother to child become chronic contrary to only about 5% of adult infections that get to be chronic. More so without immune-prophylaxis, 10–40% of HBsAg-positive pregnant women will pass the virus to their neonates [3, 4]. Despite this high risk of perinatal transmission, pregnant women are rarely screened routinely in most health facilities in Cameroon. Few other studies have investigated the prevalence, knowledge, Attitudes, practices, surrounding Hepatitis B in pregnant women in parts of Cameroon but little is known about hepatitis B virus in rural areas like Loum, Cameroon. Our study determined the prevalence, assessed knowledge of hepatitis B and identified risk factors of Hepatitis B in pregnancy in the Loum Health District of Cameroon.

## 2. Materials and Methods

### 2.1. Study Area, Design and Sampling

This dual hospital and community-based study was carried out within the 5 health areas of the Loum Health District; Babong, Loum 1, Loum 2, Loum 3, Loum Chantier, which covers a population of 71,320 inhabitants. All 24 health care facilities within the health district were included in the study and participants were drawn either from the hospital or community within each health area according to the population size of the health area (Probability proportionate to size). In all 200 pregnant women participated in the study, 10 from Babong, 31 from Loum 1, 53 from Loum 2, 44 from Loum 3, and 62 from Loum Chantier. The study employed a cross-sectional design and participants were recruited by a simple random sampling.

### 2.2. Ethical Considerations

Ethical clearance was acquired from the Institutional Review Board (IRB) of the Faculty of Health Sciences, University of Buea (1367-04). Administrative clearance for the study was gotten from the Littoral regional delegation for public health and from the heads of all health facilities that

were involved in the study. Only pregnant women who consented to participate in the study were enrolled. To guarantee confidentiality codes were used to identify participants.

### 2.3. Data Collection and Laboratory Investigation

A questionnaire that was prior tested was used to collect information on socio-demographics characteristics, knowledge and risk behaviors of participants. When participants were done filling the questionnaire, 2 ml of blood was collected by venipuncture into a tube with the anticoagulant Ethylene Di-amine Tetraacetic Acid (EDTA) using recommended WHO standards [8]. The blood was centrifuged for 3 minutes and following the manufacturer's guide, the DiaSpot One Step Hepatitis B test (SmartCare test strip) was used to test the plasma obtained for HBsAg.

### 2.4. Statistical Analysis

The data from the field were entered into a template developed in Epi info (version 7.) and exported to SPSS version 26 for analysis. Descriptive statistics was carried out with summary statistics and frequency tables being used to present results. A logistic regression model was fitted to identify factors independently associated with the knowledge and prevalence of hepatitis. Statistical significance was set at  $p$  value  $<0.05$ .

## 3. Results

### 3.1. Demographic Characteristics

The age range of participants was 16–45 with mean age of  $28 \pm 6.82$  years, Farmers were predominant (36.5%) and 35% of participants had no formal education. More than half of the women (59%) were married while only 2% had an income  $>100,000$  XAF per month (Table 1).

**Table 1.** Socio demographic characteristics of study participants.

Demographic Characteristics	Category	Frequency	Percentage (%)
Occupation	Farming	73	36.5
	Tailoring	18	9.0
	House wife	28	14.0
	Business	24	12.0
	others	57	28.5
	Total	200	100
Age [Years]	16–25	83	41.5
	26–35	89	44.5
	36–45	28	14.0
	Total	200	100
Level of Education	No formal education	70	35.0
	Primary	52	26.0
	Secondary	56	28.0
	University	22	11.0
	Total	200	100
Income level	10–50000	83	41.5
	$>50000$	73	36.5
	$>100000$	44	22.0
	Total	200	100

Demographic Characteristics	Category	Frequency	Percentage (%)
Marital status	Single	57	28.5
	Divorced	13	6.5
	Concubine	12	6.0
	Married	118	59.0
	Total	200	100
Religion	Christian	178	89.0
	Muslim	22	11.0
	Total	200	100
Form of marriage	Polygamy	37	18.5
	None	89	44.5
	Monogamy	74	37.0
	Total	200	100

### 3.2. Prevalence of Hepatitis B and Associated Factors

Of the 200 pregnant women tested, 18 were sero-positive for HBsAg thus giving a prevalence of 9%. There was no significant association between the prevalence of hepatitis B and socio-demographic factors. A history of multiple sex partners (AOR=5.58,  $P=0.001$ ), history of surgery (AOR=3.04,  $P=0.026$ ) and history of tattooing (AOR=2.36,  $P=0.041$ ) were all significantly associated with hepatitis B sero-positivity. Other factors like having an abortion, having a blood transfusion and having a family member positive for hepatitis B were not significantly associated with being hepatitis B positive in our study (Table 2).

**Table 2.** Association between hepatitis B prevalence and risk practices.

Demographic characteristics	Negative	Positive	AOR	95% CI	P Value
History of blood transfusion					
No	148 (90.2)	16 (9.8)	1	-	-
Yes	34 (94.4)	2 (5.6)	0.54	0.19-2.47	0.432
History of direct blood contact					
No	149 (92)	13 (8)	1	-	-
Yes	33 (86.8)	5 (13.2)	0.57	0.19-1.72	0.325
History of multiple sexual partners					
No	134 (95.7)	6 (4.3)	1	-	-
Yes	48 (80)	12 (20)	5.58	1.98-15.7	0.001
Family member positive for HBV					
No	140 (90.9)	14 (9.1)	1	-	-
Yes	42 (91.3)	4 (8.7)	0.95	0.29-3.04	0.934
History of surgery					
No	137 (93.8)	9 (6.2)	1	-	-
Yes	45 (83.3)	9 (16.7)	3.04	1.13-8.13	0.026
History of abortion					
No	137 (92.6)	11 (7.4)	1	-	-
Yes	45 (86.5)	7 (13.5)	1.93	0.70-5.29	0.197
History of tattooing					
No	158 (92.9)	12 (7.1)	1	-	-
Yes	24 (80)	6 (20)	2.36	1.10-6.38	0.041

### 3.3. Knowledge of Hepatitis B Among Participants

To assess knowledge on hepatitis B, participants were asked 18 questions with each scored 1 point. The mean score was  $8.67 \pm 2.7$ . Having a score of 9 and above on 18 was considered adequate knowledge in our study and only 77 (38.5%) of women had adequate knowledge (Table 3). Single

women had a significantly 2 times higher chance of having adequate knowledge on Hepatitis B than the married pregnant women (AOR=1.94,  $P=0.043$ ) while having no formal education (AOR=0.26,  $P=0.009$ ) or primary education (AOR=0.21,  $P=0.004$ ) significantly reduced women's chances of having adequate knowledge (Table 3).

**Table 3.** Association between knowledge of Hepatitis B and demographic characteristics.

Demographic characteristics	Inadequate	Adequate	Odds ratio	95% CI	P Value
Occupation					
Farming	48 (65.8)	25 (34.2)	0.62	0.31-1.26	0.189
Tailoring	12 (66.7)	6 (33.3)	0.59	0.19-1.80	0.361
House wife	17 (60.7)	11 (39.3)	0.77	0.30-1.94	0.581
Business	15 (62.5)	9 (37.5)	0.71	0.26-1.90	0.502
Others	31 (54.4)	26 (45.6)	1	-	-
Age [Years]					
16-25	54 (65.1)	29 (34.9)	0.62	0.26-1.47	0.280
26-35	54 (60.7)	35 (39.3)	0.75	0.32-1.76	0.506
36-45	15 (53.6)	13 (46.4)	1	-	-
Level of Education					
No formal level	48 (68.6)	22 (31.4)	0.26	0.09-0.71	0.009
Primary	38 (73.1)	14 (26.9)	0.21	0.07-0.61	0.004
Secondary	29 (51.8)	27 (48.2)	0.53	0.19-1.46	0.223
University or higher	8 (36.4)	14 (63.6)	1	-	-

Demographic characteristics	Inadequate	Adequate	Odds ratio	95% CI	P Value
Income level					
10-50000	47 (56.6)	36 (43.4)	1.48	0.69-3.16	0.311
>50000	47 (64.4)	26 (35.6)	1.07	0.48-2.34	0.867
>100000	29 (65.9)	15 (34.1)	1	-	-
Marital status					
Single	28 (49.1)	29 (50.9)	1.94	1.02-3.69	0.043
Divorced	8 (61.5)	5 (38.5)	1.17	0.36-3.81	0.791
Concubine	10 (83.3)	2 (16.7)	0.37	0.07-1.79	0.222
Married	77 (65.3)	41 (34.7)	1	-	-
Religion					
Christian	106 (59.6)	72 (40.4)	2.3	0.81-6.54	0.115
Muslim	17 (77.3)	5 (22.7)	1	-	-
Form of marriage					
Polygamy	28 (75.7)	9 (24.3)	0.49	0.20-1.20	0.123
None	50 (56.2)	39 (43.8)	1.21	0.64-2.26	0.535
Monogamy	45 (60.8)	29 (39.2)	1	-	-

## 4. Discussion

The prevalence of 9% obtained from our study is within the national prevalence range reported to be from 6-16% [8]. This reveals that according to WHO classification, Loum is in a region of high endemicity for HBV infection [9]. Children infected with the HBsAg from their mothers have up to 90% probability of developing chronic disease compared to only 5% for adult infections [6, 7]. This indicates that hepatitis B transmission from mother to child remains a principal public health issue especially in low income countries. The prevalence in this study is similar to the 8.5% reported from Eastern Ethiopia by Roble et al. [4], and the 9.7% reported by Frambo et al, [10] in Buea among pregnant women. our results are however higher than the 5.4% reported by Ndumbe et al., [11] working with pregnant women in another rural setting of Cameroon, and 2.9% reported by Kayondo et al [3] among pregnant women attending antenatal at the Mulango hospital in 2019. This difference could be attributed to differing geographical, cultural and behavioral influences among the different study participants.

Our study results showed that participants who had engaged with multiple sexual partners, had gone through surgery, and who had done tattoos, had a significantly higher risk of hepatitis B infection. Giving that hepatitis B is transmitted via blood and other body fluids sourced from blood, people who engage with multiple partners unprotected are more likely to be infected with the virus. Also during surgery and tattooing, if aseptic procedures are not well respected, people may be infected. Roble et al., in Eastern Ethiopia have also reported engaging with multiple sexual partners and having gone through surgery to be risk factors for hepatitis B in pregnant women [4]. Contrary to their study we did not find family history of hepatitis B to be significantly associated to hepatitis B among pregnant women. Abongwa et al., working in the North West region of Cameroon also reported engaging with multiple sexual partners, scarification or tattooing, and having had surgery before to be risk factors for hepatitis B in pregnant women [12]. They also reported blood transfusion as a risk factor which was found contrary in our study. Cetin et al., [13] have also reported tattooing as a risk factor working among

pregnant women in South West Cameroon.

Hepatitis B is one of the infections that can be easily transmitted from a mother to her unborn child and thus knowledge of hepatitis B is especially vital for women. Our study considered adequate knowledge of hepatitis B at just 50% and yet only 38.5% of women sampled had adequate knowledge. The mean knowledge score was  $8.67 \pm 2.7$  which was below the average of 9. This overall low level of knowledge among pregnant women concerning hepatitis B, further highlights the threat posed to children born to such mothers especially those women who do not go through antenatal clinics before child birth. Our findings are similar to the study carried out in North West Ethiopia that involved 354 pregnant women with only 26.6% of them having adequate knowledge on hepatitis B [14]. Similarly another study among pregnant women in Ghana had only 29.6% of women with adequate knowledge of Hepatitis B [15]. Understanding the ways by which a disease is transmitted is very key towards preventing the disease. Particularly disturbing from our study was limited knowledge concerning the transmission of hepatitis B. Only 18.5% of our respondents knew HBV can be transmitted through blood transfusion, 9% knew it is transmissible through sharing of needles and 37% knew it could be transmitted via unprotected sexual intercourse. However 77% rightfully indicated that hepatitis B could be transmitted from a mother to her unborn child. Other studies have also reported similar good knowledge of mother to child transmission of HBV among pregnant women [16-18]. Lack of knowledge of the other means of HBV transmission can be attributed to the low visibility of the issue of HBV within communities unlike diseases like HIV/AIDS, malaria and other STIs. This low level of knowledge demands that there be tailored health education among pregnant women in order to prevent and control the spread of Hepatitis B.

Compared to women with a university education women with no formal education and women with only primary education had significantly lower knowledge level. This is not surprising given that most material for education on hepatitis B is usually print which only more educated women can read. The study by Pandey et al., in India also reported level of education as a significant determinant of pregnant women's knowledge on hepatitis B [19]. Single women also had

significantly higher knowledge compared to Married women in our study. We thought that this was because most of the single women were more likely to be younger and more educated than their married counterparts.

## 5. Conclusion

As in the rest of Cameroon and sub-Saharan Africa as a whole, there is a high hepatitis B prevalence among pregnant women in Loum. This further highlights the importance of reinforcing the prevention and control measures against the disease. The prevention of transmission from mother to child remains one of the most effective control measures. Our study revealed that although women who were more educated had better knowledge of hepatitis B, overall there is still very low level of knowledge among pregnant women. Measures directed specifically to educate pregnant women on the disease, its mode of transmission and control are very necessary in order to stop continued morbidity and mortality due to hepatitis B.

We would recommend that there be further research to investigate the particular gaps in the prevention of hepatitis B from mother to child in LMICs and the possible strategies to close these gaps.

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