Global Journal of
Health Science
(GJHS)

Knowledge, Practices and Attitude of Pregnant Women on Prevention and Transmission of HIV, Hepatitis B and C With Respect to Educational Level among Pregnant Women Visiting Health Centers at the Mifi Health District in Cameroon

Alphonse Tendonge Asobochia, Ulrich Dama, François Anicet Onana Akoa, Melkior Fobasso Dzeuta, Desire Tchoffo, Jean Ndibi Abanda, Henri Lucien Kamga

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

Knowledge, Practices and Attitude of Pregnant Women on Prevention and Transmission of HIV, Hepatitis B and C With Respect to Educational Level among Pregnant Women Visiting Health Centers at the Mifi Health District in Cameroon

Alphonse Tendonge Asobochia[1,2,5,3], Ulrich Dama[2,3], François Anicet Onana Akoa[2,3], Melkior Fobasso Dzeuta[2], Desire Tchoffo[3,5], Jean Ndibi Abanda[3,4], Henri Lucien Kamga[2, 6]

[1]Department of Public Health Epidemiology, Faculty of Health Science University of Maroua-Cameroon
[2]Department of Public Health and MLS Faculty of Medical and Biomedical Science, ISSAB University Institute
[3]Department of Public Health and MLS Faculty of Science, University of Lisala (CIREP-UNILIS), Lisala-DRC
[4]National Order of Medical and Sanitary Professions, Yaounde-Cameroun
[5]Department of Biomedical Sciences, Faculty of Health Sciences, University of Bamenda, Bamenda-Cameroun
[6]Department of Public Health and Faculty of Medical and Biomedical Sciences, University of Yaounde 1 Cameroon

Article History

Received 4th May 2024

Received in Revised Form 5th June 2024

Accepted 3rd July 2024

How to cite in APA format:

Asobochia, A., Dama, U., Akoa, F., Dzeuta, M., Tchoffo, D., Abanda, J., & Kamga, H. (2024). Knowledge, Practices and Attitude of Pregnant Women on Prevention and Transmission of HIV, Hepatitis B And C With Respect to Educational Level among Pregnant Women Visiting Health Centers at the Mifi Health District in Cameroon. *Global Journal of Health Sciences*, *9*(4), 26–39. https://doi.org/10.47604/gjhs.2730

Abstract

Purpose: Human immunodeficiency virus (HIV) and hepatitis B virus (HBV) , hepatitis C virus are causes of significant morbidity and mortality across the World .HIV and HBV&HCV are blood-borne viruses transmitted usually through sexual contact and use of unsterilized needles. Their similar means of transmission increases the risk of contracting both infections concurrently. This study was aimed at assessing the knowledge, practices and attitude of pregnant women on prevention and transmission of HIV, hepatitis B and C with respect to educational level at the Mifi health district.

Methodology: This study was a descriptive cross sectional study involving pregnant women who visited different health centers with the Mifi health district between the month of January to june 2023. Sampling was done by convenience Data was analysed using version 20.0. and the data was presented in tables and bar graphs, meanwhile the pearson chi square test was used to compare variables under investigation at a confidence interval of 95%, providing a 5% error margin. Descriptive values were expressed as the frequency, percentage, and mean ± standard deviation (SD).

Findings: Out of the 467 participants, 80.73% were within the poor knowledge range whereas 12.63% showed good knowledge (while 6.63 recorded excellent knowledge scores. 44.96% were within the poor practice range while 55.03% showed good practice. majority showed poor attitude toward transmission and prevention of HIV, HBV and HCV as only 18(3.85%) were willing to meet the doctor if they were diagnosed of any of the above mention infections meaning 449 (96.14%) will embrace fear and sadness. Majority of pregnant women in this study had good knowledge regarding prevention and transmission of HIV,HBV and. Irrespective of the knowledge, practices and attitude of the participants were generally poor at the Mifi health district in Cameroon.

Unique Contribution to Theory, Practice and Policy: This research have come to set standard in health facilities in the mifi health district by proving beyond doubt that pregnant women are co infected with both HIV,HBV, and HCV and giving the poor attitude and practices among women that fuel the transmissions of these infections, we stand to advocate that all women presenting for ANC, should be compulsorily tested for HIV,HBV and HCV and equally much education on the transmission mode of these infections by the nurses should be implemented. This study have saved as an eye opener to policy makers to impost the testing of HIV, HBV and HCV during every first ANC visit and possibly two weeks before delivery.

Keywords: *HIV, HBV, HCV, Knowledge, Attitude, Practices, Pregnant Women*

INTRODUCTION

Blood borne viral infections such as Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human Immunodeficiency virus (HIV) cause substantial mortality and morbidity worldwide according to Nyirenda *et al.* (2008).Viral hepatitis during pregnancy is closely related to high risks of maternal and neonatal complications Nyirenda. et al (2008). HBV infection occurs globally and constitutes a major public health problem. It infects over 20 million people globally every year, and there are around 350–400 million chronic carriers. More than 1.2 million deaths occur annually from HBV-related disease, making it the 10th leading cause of death, and the second most common cause of cancer deaths after tobacco, globally (Sathiyakala *et al.*, 2017; Yelemkoure *et al.*, 2018). HBV is an infectious disease, and it mainly transmits through mother-to-child, skin and mucous membrane infections by contaminated blood or body fluids, sexual contacts, and injection drug abuse thus the need to measure the prevalence in the west region of Cameroon among pregnant women. In addition, body tattooing, ear piercing, acupuncture, dialysis, and even using a syringe can be the source of infection (Mesfin and Kibret, 2013). HBV acquisition in adulthood commonly leads to acute resolved infection and immunity. But, perinatal/neonatal HBV infection more likely leads to chronic infection and its long-term disease risks (Dionne-Odom, 2016). Worldwide the prevalence of HCV infection in pregnant women and children has been estimated at 1–8% and 0.05–5%, respectively. Although, direct percutaneous inoculation is the most efficient mode of transmission of HCV, sexual, household, occupational, and vertical transmission may also be important (Gasim, 2013; Bafa,2020). MTCT of HCV increases to 4–25% times if the mother is also HIV positive (Dabsu, 2017), such findings provked this research project as little data is available in bafoussam which is the capital city of the west region.

Over the last decades, HIV infection has been one of the largest public health challenges, especially in low and middle-income countries (Bafa, 2020). Among the HIV positive patients, 2–4 million are estimated to have chronic HBV co-infection, and 4–5 million are co-infected with HCV **(**Mutagoma *et al*., 2017). HIV in pregnancy has adverse outcomes to maternal and fetal health and also to health workers at times of delivery (Zhao, 2014). Hepatitis B virus (HBV) is a deoxyribonucleic acid (DNA) virus belonging to a family Hepadnaviridae that causes acute or chronic infection [T. J. Liang; 2009]. HBV infection is the 10th leading cause of death resulting 500,000 to 1.2 million deaths per year, with 2 billion people infected worldwide and 257 million suffering from chronic HBV infection, of which 10% of these are in sub-Saharan Africa and East Asia [W H O 2017 , S. F. Hussain et al (2016).

HBV infection is the 10th leading cause of death resulting 500,000 to 1.2 million deaths per year, with 2 billion people infected worldwide and 257 million suffering from chronic HBV infection, of which 10% of these are in sub-Saharan Africa and East Asia [W H O 2017 , S. F. Hussain et al 2016]. HBV affects all age groups globally including pregnant woman and the newly born infant vertically. The global prevalence of HBV among pregnant women and rate of vertical transmission greatly vary from continent to continent [H. S. Barut;2011]. Several ways of HBV transmission are registered including contaminated blood transfusion, unprotected sex, and streak with contaminated sharp objects [A. Muhammad et al ; 2016]. Mother-to-child transmission (MTCT), by which HBV is transmitted from infected mothers to their infants, prenatal transmission (in utero), natal transmission (during delivery), or postnatal transmission (during childcare or through breast milk, is the main route of infection in infants [Z. Han et al 2017, M. Ngaira, et al2016]. Following HBV infection, many people with HBV

may not show any symptoms and the clinical manifestations vary in acute and chronic cases from nonspecific symptoms to organ failure [A. Muhammad (2016).

Another study by Nyarko et al. (2019) on knowledge, attitudes and practices regarding the prevention of mother-to-child transmission of HIV among pregnant women in the Bosome Freho District in the Ashanti region of Ghana noted a whopping 77% on the level of knowledge of pregnant women attending ANC in the Ashanti region of Ghana , In another study in Ethiopia, published on Knowledge, Attitude, and Practice towards Hepatitis B Virus among Pregnant Women Attending Antenatal Care at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia and according to his findings, Majority of the respondents(85.87%) had never screened for HBV, and only 28.5% of the participants believed that hepatitis B can cause liver cancer showing good practices regarding prevention and transmission of Hepatitis B.

Statement of Problem

In the west region of Cameroon, only a little information is available on co-infection of HIV and Hepatitis B&C among pregnant mothers. Thus, it is important to determine co-infection of human immunodeficiency and hepatitis B&C viruses, and relationships with knowledge attitude and practice among pregnant women in the Mifi health district, therefore this study came to create awareness and also contribute to policy making on the test which pregnant women must do prior to their first and last ANC visit, which will help to cub mother to child transmission of these deathly infectious diseases . Hepatitis C virus (HCV) and hepatitis B virus (HBV) infections are common among patients with human immunodeficiency virus (HIV) infection because of shared routes of viral transmission. Liver disease due to chronic HBV and HCV infection is becoming a leading cause of death among persons with HIV infection worldwide, and the risk of death related to liver disease is inversely related to the CD4 cell count. HBV infection occurs globally and constitutes a major public health problem. A study published by R. E.Tanjong et al in 2016 on Sero prevalence of Human Immunodeficiency Virus and hepatitis viruses and their correlation with CD4 T-cell lymphocyte counts in pregnant women in the Buea Health District of Cameroon revealed an HIV sero prevalence of 8.37% . But, no study have been published on the co-infection of HIV, HCV and HBV Viruses, and relationships with knowledge attitude and practice on prevention and transmission among pregnant women in the Mifi health district so the present study was aimed to bring out these interesting findings about these infectious diseases which are of public health concern

METHODOLOGY

Study Setting

Bafoussam (Mifi) is the capital and largest city of the West Region of Cameroon, in the Bamboutos Mountains. Mifi health district is one of the 3 health districts in the Bafoussam health Zone. Bafoussam is the 3rd most important (financially) city in Cameroon, after Yaounde and Douala. The city was reported to have the highest prevalence of HIV infection among pregnant women attending ANC, which varied between 7.8%-8.0% in the years 2000,. The Urban Community of Bafoussam, is a decentralized territorial collectivity. Originally called Urban Commune of Bafoussam, the Urban Community of Bafoussam, was born after the Presidential Decree N ° 2008/022 of January 17, 2008 and composed of three communes, namely: the Commune of Bafoussam I (Bafoussam proper), the Commune of Bafoussam II

(Baleng) and the Commune of Bafoussam III (Bamougoum).The Bafoussam regional hospital is located about 800meters away from the main road leading to Yaounde.

Study Design

This was a descriptive hospital-based cross-sectional study composed of pregnant women visiting the various Antenatal Clinics (ANC) in Mifi health district from January to June 2023.

Study Period

Data was collected for 6months (January 2023 to june 2023).

Study Population

All pregnant women attending ANC in 5 most popular hospitals and clinics [Bafoussam regional hospital, Mifi district hospital, Clinic de louest, Mbingo annex clinic bafoussam and Clinic de soeur] in the Mifi health district were enrolled in the study.

Inclusion Criteria

- All pregnant women attending ANC in the above mention health facilities of mifi, who gave their concern to participate in the study.

Non-Inclusion Criteria

- Pregnant women who were present in the hospital or clinic at the time of the study but refuse to feel the concern form.
- Pregnant women who initially were recruited, but for one reason or another change their mind about taking part in the study.

Sample Size and Sampling Techniques

Convenience sampling method was applied in this study. Within the 6 months period that data was collected, participants were selected in the order they come and their consents were gotten after the study procedure had been explained to them.

Sample Collection

This study was a cross sectional study were participants were recruited as they give their contact, given that all targeted health center and hospitals of Mifi were visited simultaneously on all working days as from 7:30am to 11am. All eligible and consenting women were interviewed using a standardized questionnaire which was drafted by us. After explaining the procedure of the work to the participants, the following samples were collected from each participant: 10 ml of whole blood (5 ml was put in dry tubes to obtain serum while the remaining 5 ml was put in EDTA tubes to obtain plasma). The blood samples collected were later transported in safety flask to the clinical laboratory of the Bafoussam regional hospital., where all laboratory findings were done. Participants' results were returned and those of HIV-positive women after post-test counselling were directed into regular care at the hospital day clinics.

RESULTS

Socio-demographic Characteristics

A total of 524 pregnant women were actually contacted in this study but only 467 pregnant women gave their concent and completed their questionaires, giving a participation rate of 89.12% and a 100% response rate from the 467 pregnant women who completed their questionaires from the various ANC clinics in the Mifi health district. The mean age was 26.23

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

years (SD ± 4.92 and S.E.M ± 0.22), and the max age was 40 (R: 18 to 40) years. Majority of the participants were actually between the age range 26-30years, followered by those between the ages 21-25years(32.3%) and it is worth noting that 57 (12.2%) of the expecting mothers who took part in this study were between the ages 15-20years. The educational status tally showed that 22 (4.7%) were unable to read and write, while majority,53.3% attended secondary school as well as 150(32.1%) who had gone upto university level. 230 (49.3%) were married while 37.3% of the participants were single expecting mothers. On a general look, majority (74.4%) of the pregnant women who took part in this study were Christians. Details on Table 1.

Table 1: Socio-Demographic Information among Pregnant Women Visiting Health Centers in the Mifi Health District

Categories		Frequency (n)	Percent (%)	C.Percent (%)
Age Ranges	15-20 Years	57	12.2	12.2
	21-25 years	151	32.3	44.5
	26-30years	191	40.9	85.4
	31-35years	39	8.4	93.8
	36-40years	29	6.2	100.0
Marital status	Single	174	37.3	37.3
	Married	230	49.3	86.5
	Divorced	36	7.7	94.2
	Widow	25	5.4	99.6
	No response	2	.4	100.0
Educational Level	Primary level	46	9.9	9.9
	Secondary level	249	53.3	63.2
	Tetiary level	150	32.1	95.3
	No former education	22	4.7	100.0
Religion	Christian	349	74.7	74.7
	Muslem	46	9.9	84.6
	Others	72	15.4	100.0
Employment	Government worker	68	14.6	14.6
	Private worker	89	19.1	33.6
	Self employed	127	27.2	60.8
	Not working	154	33.0	93.8
	House wife	29	6.2	100.0

Knowledge, Attitude and Practices of Pregnant Women on Prevention and Transmission of HIV, Hepatitis B and C With Respect to Educational Level among Pregnant Women Visiting Health Centers at the Mifi Health District

Out of the 467 participants, 80.73% were within the poor knowledge range whereas 12.63% showed good knowledge (while 6.63 recorded excellent knowledge scores. The mean statistics (5.28 S.E.M ±0.96) was a clear indication that knowledge on prevention and transmission of HIV, Hepatitis B and C was generally poor in this study (fig 1 below). According to the present

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

findings, 163(57.4%) of the participants who had secondary school level did not know that HIV and HBV could be transmitted from mother to child during delivery and while majority of women who had attended atleast university level were aware of this transmission from mother to child during birth 95(51.9%), while 294(62.95%), 179(38.32%), and 467(100%) of them did not know the type of diease caused by, HBV and HCV(p-value < 0.001) , weather hepatitis could affect all ages group and all participants said hepatitis B and C vaccines were not readily available respectfully, Moreover,365 (78.15%) of the participants did not know that diarrhea, constipation, nausea, vomiting, and loss of appetite common symptoms of hepatitis B and C(p-value < 0.001) (Table 2)Out of the 467 participants, 44.96% were within the poor practice range while 55.03% showed good practice as shown on figure 1.

Table 2: Assessment Questions/Categories on Knowledge of HBV and HCV among Pregnant Women in the Mifi Health District

Assessment questions /categories		Educational Level				
		Primary level	Secondary level	Tetiary level	No former education	p-value
Have you ever heard of a disease caused by the hepatitis B and C viruses	Yes	25(7.8)	181(56.6)	114(35.6)	0	< 0.001
	No idea	21(14.3)	68(46.3)	36(24.5)	22(15.0)	
Can hepatitis B or C affect the liver	Yes	10(5.8)	74(42.8)	89(51.4)	0	< 0.001
	No	3(4.6)	62(95.4)	0	0	
	No idea	33(14.4)	113(49.3)	61(26.6)	22(9.6)	
Can hepatitis B or C cause liver cancer	Yes	0	20(17.4)	95(82.6)	0	< 0.001
	No	17(16.3)	82(78.8)	0	5(4.8)	
	No idea	29(11.7)	147(59.3)	55(22.2)	17(6.9)	
Are diarrhea, constipation, nausea, vomiting, and loss of appetite common symptoms of hepatitis B and C	Yes	17(16.7)	60(58.8)	22(21.6)	3(2.9)	< 0.001
	No	14(14.9)	39(41.5)	27(28.7)	14(14.9)	
	No idea	15(5.5)	150(55.4)	101(37.3)	5(1.8)	
Can hepatitis B or C affect all age groups	Yes	1(0.3)	167 (58)	120(41.7)	0	< 0.001
	No	4(38.3)	54(26.2)	9(12.5)	5(6.9)	
	No idea	41(38.3)	28(26.2)	21(19.6)	17(15.9)	
Are there patients with hepatitis B or C without symptoms	Yes	46(9.9)	249(53.3)	150(32.1)	22(4.7)	
Can hepatitis B or C be transmitted through contaminated blood	No idea	22(5.2)	249(58.5)	150(35.2)	5(1.2)	< 0.001
	Yes	24(58.5)	0	0	17(41.5)	
Can hepatitis B or C be transmitted through unprotected sex	Yes	46(9.9)	249(53.3)	150(32.1)	22(4.7)	
Can hepatitis B or C be transmitted from mother to child	Yes	1(0.5)	86(47)	95(51.9)	1(0.5)	< 0.001
	No	45(15.8)	163(57.4)	55(19.4)	21(7.4)	
Is hepatitis B or C curable/ treatable	Yes	46(9.9)	249(53.3)	150(32.1)	22(4.7)	
Is hepatitis B and C vaccination available in health centers	No	22(5.8)	207(54.6)	150(39.6)	0	

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

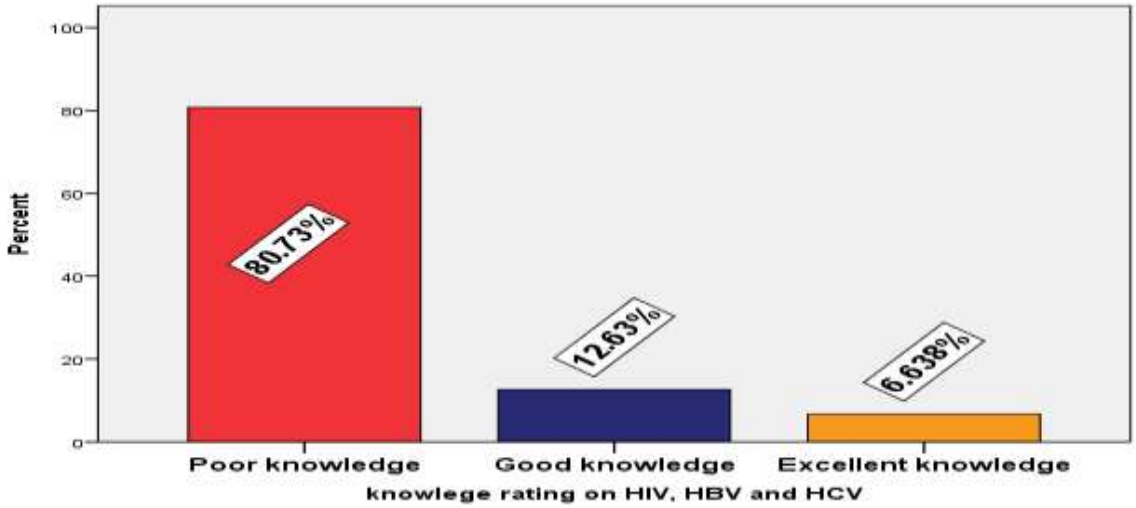

Figure 1: Knowledge Score on, HBV and HCV among Pregnant Women in the Mifi Health District

Practice Scores On, HBV and HCV among Pregnant Women in the Mifi Health District

Out of the 467 participants, 44.96% were within the poor practice range while 55.03% showed good practice.

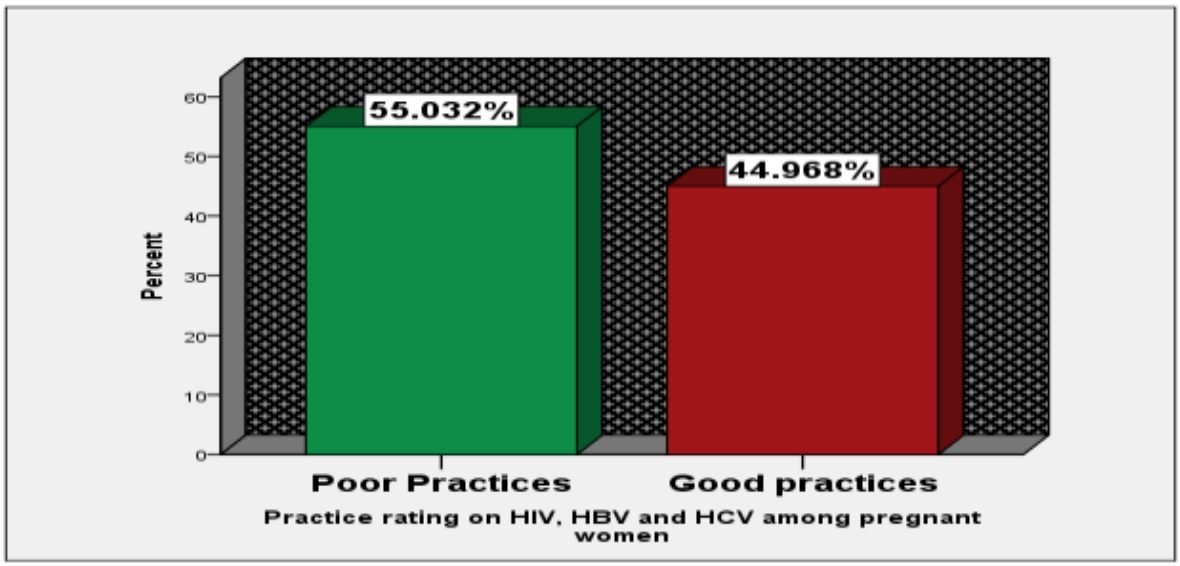

Figure 2: Practice Scores on HBV and HCV among Pregnant Women in the Mifi Health District

Irrespective of some good practices recorded in this study, majority of the respondents 282 (60.38%) had never receive any vaccine against hepatitis related infections, and surprisingly, all the 467(100%) pregnant women do not wash hands after meeting with or having close contact with unfriendly or untrusted surfaces, while 238 (50.96%) of them did not ask their barber to change the blade for safe equipment for ear and nose piercing, this findings were however statistically significant ($P < 0{:}001$). Generally, the mean statistic from the responses

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

was 3.48 .E.M ±0.51 and there was a statistical significance between participant responses and the correlation with educational level.

Table 3: Practices of Pregnant Women at the Mifi Health District in the Prevention and Transmission of HIV and Hepatitis

Practices		Educational Level				
		Primary level N(%)	Secondary level N(%)	Tetiary level N(%)	No former education N(%)	P value
Do you ask your barber to change the blade for safe equipment for ear and nose piercing	Yes	22(9.6)	160(69.9)	47(20.5)	0	(*P* < 0:001)
	No	24(10.1)	89(37.4)	103(43.)	22(9.2)	
When diagnosed with HIV, HBV and HCV , would you go for further investigation and treatment	Yes	25(6.3)	206(51.9)	144(36.)	22(5.5)	(*P* < 0:001)
	No	21(30.0)	43(61.4)	6(8.6)	0	
Have you got yourself vaccinated against, HBV and HCV	No	16(5.7)	176(62.4)	79(28.0)	11(3.9)	0.06
	Yes	30(16.2)	73(39.5)	71(38.4)	11(5.9)	
Do you avoid meeting HIV, HBV and HCV patients	Yes	41(10.4)	201(51.1)	129(32.8)	22(5.6)	0.5
	No	5(6.)	48(64.9)	21(28.4)	0	
Washing hands with water & soap after having close contact with other people	No	46(9.9)	249(53.)	150(32.)	22(4.7)	

Assessment of Attitude towards HBV and HCV among Pregnant Women at the Mifi Health District

Out of the 467 participants who took part in this study, 40.69% were having positive attitude (who answered ≥3 related questions correctly) and 59.31% were having negative attitude (who were giving answer of <3 for attitude-related questions) as presented on figure 3.

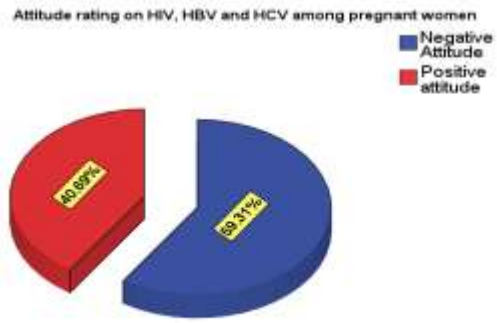

Figure 3: Attitude Scores of the Pregnant Women Who Took Part in This Study

Regarding the questions asked in the course of this study, majority showed poor attitude toward transmission and prevention of HIV, HBV and HCV as only 18(3.85%) were willing to meet

Global Journal of Health Sciences

ISSN 2519-0210 (Online)
Vol 9, Issue 4, No.3, pp 26 - 39, 2024

www.iprjb.org

the doctor if they were diagnosed of any of the above mention infections meaning 449 (96.14%) will embrace fear and sadness. All the participants 467(100%) could not say clearly if they can identify symptoms of HBV and HCV. Detailed findings are found on Table 4 below.

Table 4: Attitude of Pregnant Women at the Mifi Health District Regarding Prevention and Transmission of HBV and HCV

Evaluation on practice		**Educational Level**				
		Primary level N(%)	**Secondary level N(%)**	**Tetiary level N(%)**	**No former education**	**p value**
Do you think you can get hepatitis B or C	Yes	46(9.9)	249(53.3)	150(32.1)	22(4.7)	<0.001
How would you react if you discovered you have Hepatitis B or C	Fear	33(24.3)	85(62.5)	1(0.7)	17(12.5)	0.01
	Sadness	13(4.2)	164(52.4)	131(41.9)	5(1.6)	
	see the doctor	0	0	18(100.0)	0	
Do you have symptoms of hepatitis B and C	No	46(12.7)	172(47.4)	128(35.3)	17(4.7)	0.06
	Not sure	0	22(44.9)	22(44.9)	5(10.2)	
	I don't know	0	55(100.0)	0	0	
What will you do if you think you have symptoms of hepatitis B or C	See the doctor	46(10.9)	238(56.4)	121(28.7)	17(4.0)	<0.001
	Nothing	0	11(24.4)	29(64.4)	5(11.1)	
In your opinion, what is the cost of diagnosing and treating hepatitis B or C	Expensive	46(11.7)	223(56.7)	107(27.2)	17(4.3)	0.002
	No idea	0	26(35.1)	43(58.1	5(6.8)	

Discussions

The Knowledge on Prevention on Transmission of HIV, Hepatitis B and C among Pregnant Women

Assessing the knowledge of pregnant women in this study revealed that majority of the participants (80.73%) were within the poor knowledge range. Only 12.63% showed good knowledge. The mean statistics (5.28 S.E.M ±0.96) was a clear indication that knowledge on prevention and transmission of HIV, Hepatitis B and C was generally poor in this study. These results were obvious because the educational background of the participants was low (usually primary and secondary school dropout) and even those that had gone pass the secondary school level, did not study anything related to medical studies, clearly justifying y the participants had low knowledge on these infections. The poor knowledge recorded in the present study is in line with a similar study carried out by Gul et al. (2022) who assessed the knowledge and awareness of pregnant women on hepatitis B & C among pregnant women in Pakistan : none of the study participants had “Good” knowledge regarding the three blood-borne infections as about 52% of the women had “Poor” while 47% had “Average” knowledge. None of the study participants were aware that HIV can be transmitted during delivery. Women aged 30-35 years had significantly higher knowledge as compared to other age groups with $p < 0.001$ showing a similar finding like what we noticed in the present study. Gul et al. (2022) therefore concluded that awareness regarding Hepatitis B, Hepatitis C, and HIV amongst pregnant Pakistani women of low socioeconomic status is insufficient, and can lead to an increased risk of acquiring these infections, especially during childbirth. Another study by Nyarko et al. (2019) on knowledge, attitudes and practices regarding the prevention of mother-to-child transmission of HIV among pregnant women in the Bosome Freho District in the Ashanti region of Ghana noted a

whopping 77% on the level of knowledge of pregnant women attending ANC in the Ashanti region of Ghana , which was a very high level of awareness as compared to the present study which rather saw poor level of awareness.

The Practices of Pregnant Women on Prevention and Transmission of HIV, Hepatitis B and C among Pregnant Women

It was a point of interest on this study to examine practices of pregnant women regarding prevention and transmission of Hepatitis B, Hepatitis C and HIV infections. Few participants were within the poor practice range while 55.03% showed good practice. These results were as well obvious for common reasons such as pregnant women who had children already and have been receiving enough advice on their previous pregnancies regarding these infectious diseases and equally majority had attended secondary education, which influence knowledge and practices in this study. The majority of the participants having good practices in this study is in line with the good practices of (95.9%) recorded in a similar study by Nyarko et al (2019) on Knowledge, attitudes and practices regarding the prevention of mother-to-child transmission of HIV among pregnant women in the Bosome Freho District in the Ashanti Region of Ghana. In another study in Ethiopia, Gebrecherkos et al. (2019) published on Knowledge, Attitude, and Practice towards Hepatitis B Virus among Pregnant Women Attending Antenatal Care at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia and according to his findings, Majority of the respondents(85.87%) had never screened for HBV, and only 28.5% of the participants believed that hepatitis B can cause liver cancer showing good practices regarding prevention and transmission of Hepatitis B. In multivariable analysis, residence, income, and educational level were associated with mean score knowledge and practices in this study. The result of this present study are however not in line with a similar study that was carried out by Yankam et al (2019) where pregnant women in the Limbe Health District demonstrated good knowledge but adopted poor practices whereas in the Muyuka Health District, pregnant women demonstrated poor knowledge and adopted poor practices regarding the mode of transmission and prevention of HBV infection

The Attitude Pregnant Women on Prevention and Transmission of HIV, Hepatitis B and C among Pregnant Women

Regarding the questions asked in the course of this study, majority showed poor attitude toward transmission and prevention of HIV, HBV and HCV as only 18(3.85%) were willing to meet the doctor if they were diagnosed of any of the above mention infections meaning 449 (96.14%) will embrace fear and sadness which was a clear indication that the poor attitude of participants in this study will only fuster wide spread of the afro mention infections and this study was indeed an eye shiner to show the ministry of public health the need for more clinical biologists and public health experts in our hospitals to sensitize the population on the dangers of poor attitude toward hepatitis B, hepatitis C as well as HIV infections. A handful of participants in this study equally feel stigmatize going for testing and feel they will be rejected by their families if declared positive after laboratory analysis and consequently they shy away from testing for HBV, HCV, or HIV. The poor attitude recorded by participants in this study is how ever not in line with the study conducted by Kabamba A et al.(2023) on Knowledge, attitude, and practice towards hepatitis B and C viruses among the population of Lubumbashi, Democratic Republic of Congo who published that “Regarding the reported attitudes, we find that they were good overall (71.4%) as some participants (28.6%) had negative attitudes; some were afraid to be consulted for cases of hepatitis and preferred to see traditional healers. A study published by Kamal et al.(2021): on Pregnant Women' Knowledge and Attitude

regarding Hepatitis B Virus Infection shows that, (32.7%) and (77.3%) of studied sample had positive attitude regarding hepatitis B virus infection with pregnancy at preintervention and post-intervention phases respectively, indicating that attitude of women on preintervention attitude was poor which is in line with the current study.

Conclusion

It is crystal clear that majority of pregnant women in this study had good knowledge regarding prevention and transmission of HIV,HBV and HCV and the good knowledge is however link to education on transmission dished out to women by nurses and the high level of education that was as well recorded in this study. Irrespective of the knowledge, practices and attitude of the participants were generally poor at the mifi health district in Cameroon which explain why, despite the good knowledge, poor attitude and practices keep fueling the transmission of these infections.

Recommendations

1. Screening all HIV-positive individuals for HBV & HCV infection and vice versa/ taking all the necessary preventive measures, including immunization against HBV, is vital for prevention, early detection, and proper management of mother to child transmission and related death in people living with HIV ,HBV and HCV in and around the Mifi health district and Cameroon at large.
2. All pregnant women should be screened for HIV,HBV and HCV at their first and last ANC visit to reduce the risk of late detection and eventual transmission of these deathly infectious diseases
3. WHO guildeline on measures to prevent mother to child HIV transmission should be implemented in all anteanatal clinic in mifi health district Cameroon to reduce mother to child HIV transmission
4. Pregnant women should be routinely educated and screened for HIV, HBV and HCV in Cameroon during antenatal clinics every trimester of pregnancy.

Suggestion for Further Study

The study suggested the need to associate molecular tools in diagnostics to improve species detection.

Limitations of the Study

This study was a crossectional study and thus did not include people who could be infected but visited the health centers before or after the study period and again we had little literature concerning the study topic around the study area.

Conflict of Interest

We declare that we have no conflict of interest and that this project is the original project conducted in the Mifi health district.

Acknowledgement

A special thanks to all the staffs of the Bafoussam regional hospital , the mifi health district, my supervisors and all the co authors of this project who assisted to see this project a success.

What is known about the Study

- It is known that HIV exist among pregnant women

- Studies in other Regions of the country have published prevalence statistics of HIV among pregnant women already but this study is new in this area

What the Study Added

- This study have saved as an eye opener in the Mifi health district to sudgest that all pregnant women should be tested upon arrival for ANC on HIV, HBV and HCV, which is not a regular practice in this Health district.
- This study showed clearly that the knowledge of HIV and HBV is high among pregnant women but their attitude and practices toward this infectious disease is helping to propagate the spread of the viruses thus a need for more education during ANC

REFERENCES

A. Muhammad, (2016) "Knowledge,attitude and practice regarding hepatitis B infection among nurses in public hospitals of Niger State, Nigeria," InternationalJournal of tropical Disease & Health, vol. 12, no. 3,pp. 1–9,

Bafa T. A, and Egata A.D (2020). Seroepidemiological patterns and predictors of hepatitis B, C and HIV viruses among pregnant women attending antenatal care clinic of Atat Hospital,SouthernEthiopia.SAGEOpenMedicine.,8:19.https://doi.org/10.1177/2050312119900870 PMID: 32002184

Bafa T. A, and Egata A.D (2020). Seroepidemiological patterns and predictors of hepatitis B, C and HIV viruses among pregnant women attending antenatal care clinic of Atat Hospital,SouthernEthiopia.,8:19

Dabsu R, et al (2017). Seroepidemiology of Hepatitis B and C Virus Infections among Pregnant Women Attending Antenatal Clinic in Selected Health Facilities in East Wollega Zone, West Oromia, Ethiopia.

Dionne-Odom J. (2016), Hepatitis B in pregnancy screening, treatment, and prevention of vertical transmission.American Journal of Obstetrics and Gynecology. 214(1):6–14.https://doi.org/10.1016/j.ajog.2015.09.100 PMID: 2645412

Gasim G. I., Murad I. A., and Adam I. (2013), Regional Review Hepatitis B and C virus infections among pregnant women in Arab and African countries. The Journal of Infection in Developing Countries. 7(8):566–578. https://doi.org/10.3855/jidc.3243 PMID: 23949291

Gasim G. I., Murad I. A., and Adam I. Regional Review Hepatitis B and C virus infections among pregnant women in Arab and African countries. The Journal of Infection in

Gebrecher. et al(2019,) Hepatitis B virus and HIV co-infection among pregnant women in Rwanda. BMCInfectious Diseases. 17(1):1–7. https://doi.org/10.1186/s12879-017-2714-0 PMID: 28893207;PMCID: PMC5594460.

Gelderblom, H. R. (1997). Fine structure of HIV and SIV. In Los Alamos National Laboratory (ed) (PDF). HIV sequence Compendium. Los Alamos, New Mexico: Los Alamos National Laboratory. Pp 31-44.

Gul et al (2022) knowledge and awareness of pregnant women on hepatitis B & C among pregnant women in Pakistan

H. S. Barut, et al (2016). "Prevalence of hepatitis B virus infection in children of HBsAg positive parents," Mikrobiyoloji Bülteni, vol. 45, no. 2, pp. 359–365,2011

Kabamba A et al.(2023);Knowledge, attitude, and practice towards hepatitis B and C viruses among the population of Lubumbashi, Democratic Republic of Congo. 10.21608/ajgh.2023.188582.1030.

Kamal et al.(2021): Pregnant Women' Knowledge and Attitude regarding Hepatitis B Virus Infection: a Structured Teaching Program; Egyptian Journal of Health Care, 2021 EJH Vol. 12 No. 1301

M. Ngaira, J. Kimotho, I. Mirigi et al2016.., "Prevalence, awarenessand risk factors associated with hepatitis B infection among pregnant women attending the antenatal clinic at Mbagathi District Hospital in Nairobi, Kenya," The Pan African Medical Journal, vol. 24,

Mesfin Y. M and Kibret K. T(2013). Assessment of knowledge and practice towards hepatitis B among medicaland health science students in Haramaya University, Ethiopia. *PLoS ONE*.

Mutagoma M. et al(2017). Hepatitis B virus and HIV co-infection among pregnant women in Rwanda. BMC Infectious Diseases., 17(1):1–7. https://doi.org/10.1186/s12879-017-2714-0 PMID: 28893207;PMCID: PMC5594460.

Nyarko et al (2019) on Knowledge, attitudes and practices regarding the prevention of mother-to-child transmission of HIV among pregnant women in the Bosome Freho District in the Ashanti region of Ghana

Nyirenda M. et al(2008). Prevalence of infection with hepatitis B and C virus and coinfection with HIV in medicalinpatients in Malawi. ELISAVIER, Journal of Infection., 57:72–77. https://doi.org/10.1016/j.jinf.2008.05.004 Epub 2008 Jun 13. PMID: 18555534.

S. F. Hussain (2017). Muslehuddin, and H. M.Muslehuddin, "Knowledge, attitude and practice regarding hepatitis B among medical students," International Journal ofCommunity Medicine and Public Health,

Sathiyakala R et al(2017). Seroprevalence of Hepatitis B infection among pregnant women in South India.International Journal of Reproduction, Contraception, Obstetrics and Gynecology., 6(1): 249–251.https://doi.org/10.18203/2320-1770.ijrcog20164668

World Health Organization, Global hepatitis report 2017,World Health Organization, 2017.

Yankam et al (2019): Knowledge and practice of pregnant women and health care workers on hepatitis B prevention in the Limbe and Muyuka health districts of the south west region of Cameroon;
http://www.panafrican-med-journal.com/content/article/33/310/full/

Yelemkoure E. T. et al(2018). Prevention of mother-to-child transmission of hepatitis B virus in Burkina Faso:Screening, vaccination and evaluation of post-vaccination antibodies against hepatitis B surface antigenin newborns. Journal of Public Health in Africa. 2018, 9(3):150–153. https://doi.org/10.4081/jphia..816 PMID: 30687485

Yelemkoure E. T. et al(2018). Prevention of mother-to-child transmission of hepatitis B virus in Burkina Faso:Screening, vaccination and evaluation of post-vaccination antibodies against hepatitis B surface antigenin newborns. Journal of Public Health in Africa. 9(3):150–153. https://doi.org/10.4081/jphia.2018.816 PMID: 30687485

Z. Han,et al (2017), "Knowledge of and attitudestowards hepatitis B and its transmission from mother to childamong pregnant women in Guangdong Province, China,"PLoS One, vol. 12, no. 6, p. e0178671, 2017.

Zhao L., Daw M. A, and Shah K. B. Hepatitis C Virus: Molecular Pathways and Treatments. OMICS Group eBooks.2014: 3–13.

Zhao L., et al (2014). Hepatitis C Virus: Molecular Pathways and Treatments. OMICS Group eBooks.2014: 3–13.