Seroprevalence of Hepatitis B and Hepatitis C viral infections amongst Pregnant women attending Ante-natal Clinic in University of Benin Teaching Hospital

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ABSTRACT

Viral hepatitis is a serious global health challenge with Hepatitis B and C viral infections being implicated. This cross-sectional study was aimed at investigating the seroprevalence of hepatitis B and C virus infections and co-infections amongst pregnant women attending antenatal clinic within University of Benin Teaching Hospital. The results showed an overall prevalence rate of Hepatitis B and C which were 10.7% and 4.7% respectively. Also, the co-infection prevalence rate of hepatitis B and C was 4%. In this study, about 65% of the respondents were between age group 26-35years. The study also showed the most common mode of transmission of Hepatitis B&C was via sharing of sharp objects (29.3%) and correlation between sharing of sharp objects and hepatitis B and C infection was found to be statistically significant with P value = 0.023 and 0.036 respectively. Also, a total of 93% of the respondents were unvaccinated while 7% were vaccinated. In conclusion, there is need to create awareness through health education, proper risk identification, and prompt treatment of diagnosed cases as well as effective vaccination and immunization program to reduce the health burden of hepatitis B and C.

KEYWORDS: HEPATITIS, SEROPREVALENCE,, INFECTIONS, PREGNANT. HOSPITAL

INTRODUCTON

Hepatitis B virus (HBV) and Hepatitis C virus (HCV) belong to the families Hepadnaviridae and Flaviviridae respectively. They are a leading cause of liver cirrhosis and hepatocellular carcinoma resulting in death of millions of people annually. Viral hepatitis is a serious global health challenge (Naseeb et al. 2023). Hepatitis is an inflammatory liver disease which may be acute or chronic and can be spread via body piercings, medical procedures, drug injection equipment sharing, sexual transmission (Naeem et al 2024). Hepatitis B is more commonly spread by contact with infected body fluids in comparison to Hepatitis C (Naeem et al 2024). Acute Hepatitis lasts less than six months while chronic hepatitis persists longer (Ugbebor et al 2011).

In 2015 alone, there were more than 10 million new infections and 1.34 million fatalities worldwide due to viral hepatitis (Naseeb et al. 2023; Chilaka and Konje 2021) The global prevalence of Hepatitis C Virus (HCV) in 2015 was 71 million, and that of Hepatitis B Virus (HBV) in 2016 was 257 million. Hepatitis B and C are responsible for 96 % of all deaths from hepatitis (Chilaka and Konje 2021).

Viral hepatitis during pregnancy is associated with a higher risk of complications including jaundice, fetal and neonatal hepatitis leading to fatalities in newborns maternal mortality and the virus most implicated is Hepatitis C (Naeem et al 2024). In most cases, the clinical course is benign, but sometimes cholestasis is manifest and can be prolonged, lasting up to the puerperium. A major concern with acute viral hepatitis is the risk of Mother-to-Child-Transmission (MTCT) or vertical transmission (Dagnew et al 2020).

There is a scarcity of recent representative studies to know the burden of HBV and HCV coinfection amongst pregnant women in University of Benin Teaching Hospital. This study was aimed at assessing the magnitude of HBV and HCV infections and associated factors among pregnant women attending antenatal clinic at the University of Benin Teaching Hospital.

MATERIALS AND METHODS

STUDY AREA

The study was carried out at University of Benin Teaching Hospital (UBTH), Benin City, Edo State. The University of Benin Teaching Hospital (UBTH) is a tertiary health care center (Enaruna and Sodje 2016).

STUDY DESIGN/POPULATION

This cross-sectional study involved a total of total of 144 pregnant women attending ante natal clinic conducted from January to March, 2024 using random sampling. Those previously diagnosed with other viruses other than hepatitis B and C, those who decline consent and those who are too ill to consent and relatives refuse consent were excluded from this study. The sample size (n) for the quantitative study was calculated using the Cochran formula used for descriptive studies.[20]

$$n = \frac{Z^2pq}{d^2}$$

Where:
n = Minimum sample size
Z = Standard normal deviate at 1.96 (at 95% confidence interval)
p = Prevalence of the characteristic of interest
q = 1-p, d = degree of precision set at 0.05
P = A study on prevalence of hepatitis b and c infections among pregnant women at Dalhatu Araf Specialist Hospital Lafia, Nasarawa State Nigeria by Innocent et al a. Overall prevalence infections of viral hepatitis B was 9.4%.[6]
q = 1 – p = 1- 0.094 = 0.906

$$n = \frac{1.96^2 \times 0.094 \times 0.906}{0.05^2} = 131$$

Attrition rate
A 10% attrition rate for nonresponse will be added i.e 131 + 13 = **144**
Thus, the minimum sample used for this study will be = **144**

SAMPLE COLLECTION

5ml venipuncture blood was collected aseptically in plain tubes and serum separated via centrifugation at 3000rpm for 5 minutes and stored at -20◦C until tested. A structured questionnaire was used to collect demographic data and information on risk factors.

DETECTION OF HBsAg and HCV

Serum samples were analyzed for HBsAg and HCV antibodies using commercially available ELISA kit manufactured by CTKBIOTECH. The ELISA test was performed according to the manufacturer's instruction and results interpreted as recommended by the manufacturer of the kit.

DATA ANALYSIS

The data was analyzed using the International Business Machines (IBM) statistical package for social sciences (SPSS) software version 25.0.

RESULTS

Table 1 shows about 65% of the respondents were between the age group 26-35 years, majority (95.3%) were married while more than half (56.7%) had tertiary level of education. About 54% were multiparas (Para 2 to 4), while 67% were in their third trimester.

Table Two indicated that 64% of the respondents had heard of Hepatitis B&C. Sexual intercourse, blood transfusion and sharing of sharp objects were stated to be the most common

mode of transmission of Hepatitis B&C in 39.3%, 29.3% and 26% of respondents respectively. While 24.6% of respondents stated that limiting sex to a faithful uninfected partner, screening blood prior to transfusion and use of condoms can prevent transmission of hepatitis B&C, 39.3% were ignorant of the preventive measures.

In table 3, the most prevalent risk factor for hepatitis B&C co-infection included sharing of personal effects with others (29.3%), body piercings (27.3%), patronize local manicure/pedicure vendors (22.7%) and tribal/scarification marks (22%). Also, findings showed that 10.7% and 4.7% of respondents were positive to hepatitis B and C respectively. While, the prevalence of hepatitis B and C co-infection was 4% as indicated in table 4.

TABLE 1: SOCIODEMOGRAPHIC AND CLINICOPATHOLOGIC CHARACTERISTICS

Variable	**Frequency(n = 150)**	**Percentage**
Age group (years)		
15 – 25	24	16.0
26 – 35	98	65.3
36 – 45	28	18.7
Marital status		
Married	143	95.3
Single	7	4.7
Level of education		
Tertiary	85	56.7
Secondary	57	38.0
Primary	8	5.3
Occupational status		
Employed	116	77.3
Unemployed	34	22.7

Parity		
0	27	18.0
1	39	26.0
2 – 4	81	54.0
≥ 5	3	2.0
Trimester		
Third trimester	101	67.4
Second trimester	38	25.3
First trimester	11	7.3

TABLE 2: KNOWLEDGE OF HEPATITIS B&C INFECTION

Variable	**Frequency(n = 150)**	**Percentage**
Heard of Hepatitis B&C infection		
Yes	96	64.0
No	54	36.0
If yes, source of information		
Health facilities	69	46.0
Friends/colleagues	25	16.6
School	24	16.0
Family Members	10	6.6
Television/Radio	3	2.0
Religious centers	3	2.0
Books/magazines	3	2.0
Mode of transmission		
Sexual intercourse	59	39.3
Blood transfusion	44	29.3
Sharing of sharp objects	39	26.0
Body contact	39	26.0
Sharing personal belonging	27	18.0

Mother to child	25	16.6
Don't know	54	36.0
Prevention of hepatitis B & C infection		
Not sharing sharp objects/needles	46	30.6
Limiting sex to a faithful uninfected partner	37	24.6
Screening blood prior to transfusion	37	24.6
Use of condoms	37	24.6
Vaccination	36	24.0
Don't know	59	39.3
Hepatitis B & C can be diagnosed by blood test		
Yes	73	48.7
No	27	18.0
Don't know	50	33.3
Do you think Hepatitis B & C are curable		
Yes	22	14.7
No	42	28.0
Don't know	86	57.3

TABLE 3: RISK FACTORS FOR HEPATITIS B AND C AMONG RESPONDENTS

Variable	**Frequency(n = 150)**	**Percent**
Risk factor		
Share personal effects with others	44	29.3
Never tested for HIV	43	28.7
Have body piercings	41	27.3
Takes alcohol	36	24.0
Patronize local manicure/pedicure vendors	34	22.7
Tribal/scarification marks	33	22.0

Shave hair locally	30	20.0
Previously diagnosed with STI	29	19.3
History of blood transfusion	25	16.7
Share sharp objects with others	22	14.7
Multiple sexual partners	10	6.7
Use of intravenous drugs	5	3.3
Have had blood oath/jazz/juju markings	2	1.3
Use of illicit drugs	0	0.0
Presence of Tattoo	0	0.0

TABLE 4: HEPATITIS B AND C STATUS OF RESPONDENTS

Variable	**Frequency(n = 150)**	**Percent**
Hepatitis B		
Positive	16	10.7
Negative	134	88.3
Hepatitis C		
Positive	7	4.7
Negative	143	95.3
Co-infection	6	4.0

In Figure 1, the findings showed that 10.7% and 4.7% of respondents were positive to hepatitis B and C respectively, while the prevalence of hepatitis B and C co-infection was 4%. Gestational trimester of respondents showed that 60% of respondents were in their third trimester of pregnancy as indicated in Figure 2. Also, the age group of 25 to 34 years had the highest incidenc of both viruses as shown in Figure 3. In Figure 4, the correlation between identifiable

risk factors with hepatitis B&C infection was shown. Respondents who were not vaccinated had the highest prevalence followed by those who shares sharp objects with others.

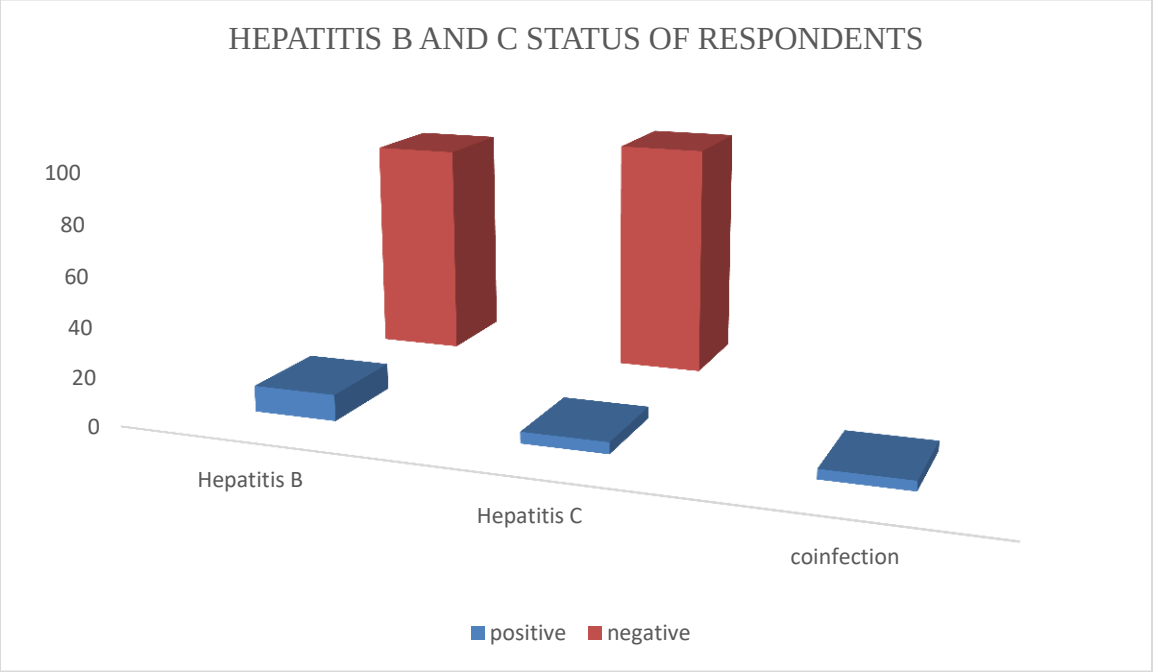

Figure 1. Hepatitis B and C status of Respondents

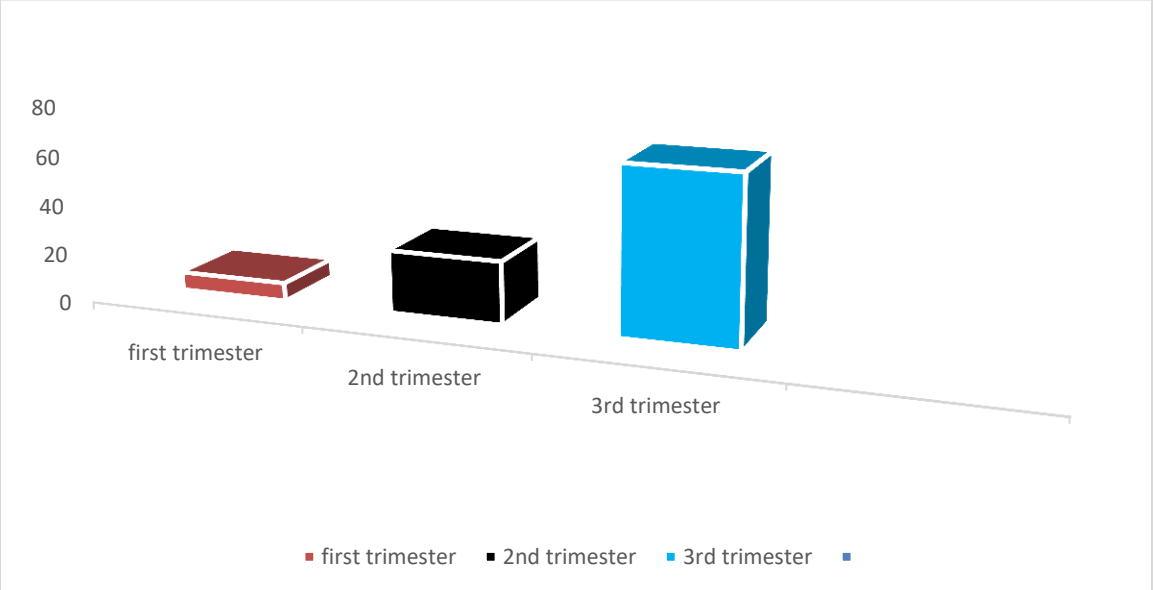

Figure 2. Gestational Trimester of Respondents

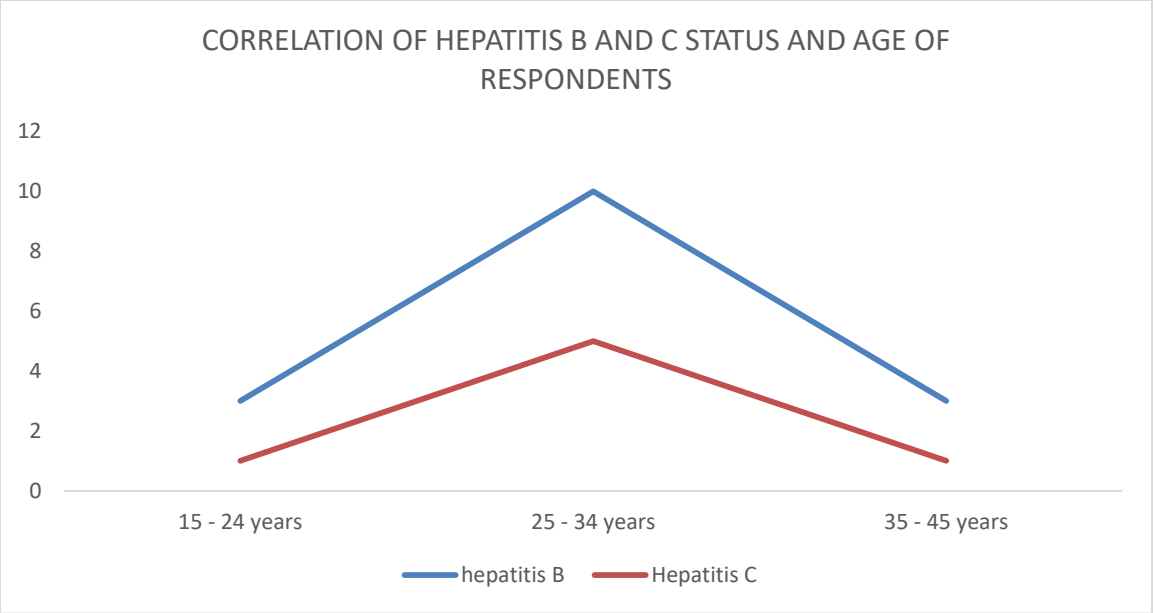

Figure 3: Correlation of Hepatitis B and C status and Age of Respondents

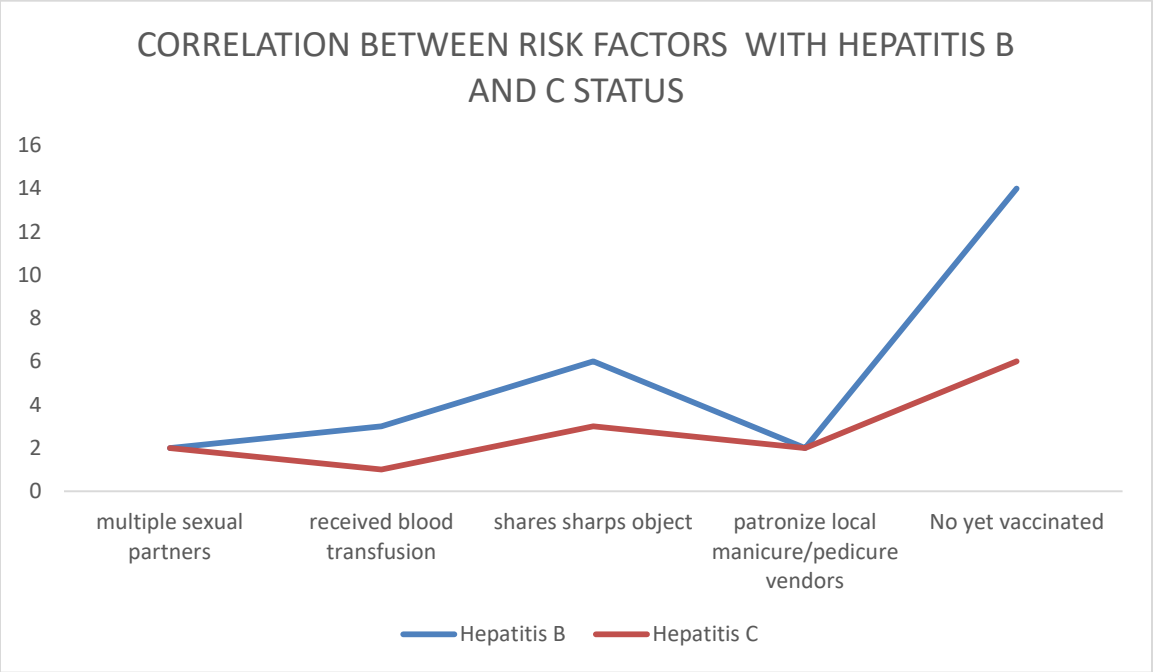

Figure 4: Correllation between Risk Factors with Hepatitis B and C status

P value = 0.023 and 0.036 for hepatitis B and C respectively for respondents who share sharp objects.

DISCUSSION AND CONCLUSION

There is well documented evidence that viral hepatitis as well as co-infections causes significant health problems in pregnancies resulting in hepatic dysfunction, maternal and infant morbidity or mortality. The study showed that the frequency of Hepatitis B and Hepatitis C infections among antenatal patients attending the University of Benin Teaching Hospital was 10.7% and 4.7% of respectively. More so, the prevalence of hepatitis B and C co-infection was 4%. This is supported by WHO report for Nigeria of 8.1 and 1.1% for HBV and HCV respectively according to the Nigeria HIV-AIDS Indicator and Impact Survey, 2018 (WHO Report 2023).

Result of this study showed that most of the patients were within the 26–35 years age group. Also, most of the patients were found to be multi gravida patients. These findings were similar to the studies conducted by Ugbebor et al, 2010.

It is important to note that prevalence of HBV infection reported in this study as 10.7% was higher than the 9.4% and 4.9% reported in Lafia (Nasarawa state) and Port Harcourt (River state), respectively.(Innocent et al 2022; Ejele et al 2004). However, it is less than the 12.5% prevalence previously reported in 2010 in Benin city, Edo state (Ugbebor et al, 2010). There was also a report of 6.7% in Bauchi state among pregnant women who tested positive to Hepataitis B virus (Chakraborty and Aithal 2023)

The prevalence of hepatitis C in this study was much lower when compared with studies from Jengre Seventh-day Adventist (SDA) Hospital, a secondary healthcare facility in the Bassa local government area of Plateau state, Northern Nigeria with prevalence of 6.5% (Amaike et al 2023). However, it is higher than previously recorded prevalence of 3.6% in Benin City in 2010 (Ugbebor et al, 2010).

A recent study conducted in Pakistan involving pregnant women screened for Hepatitis B and Hepatitis C, showed overall frequency was 3.7% and 2.1% respectively. None of the pregnant women were co-infected with HBV and HCV (Israr et al 2021). However, it is of note that Hepatitis B and C co-infection 4%. This is significantly high compared to the Pakistani study.[14]

In this study we noted a correlation between identifiable risk factors with hepatitis B&C infection. Also, the occurrence of hepatitis B and C coinfection was more amongst those who share sharp objects. Other identified risk factors are sexual intercourse, blood transfusion and mother to child transmission hepatitis. Respondents who were not vaccinated had the highest prevalence followed by those who shares sharp objects with others. The comparison between our study and the other studies should be taken cautiously because different methods had been used to screen from hepatitis B and C.

CONCLUSION

The prevalence of hepatitis B and C prevalence which 10.7% and 4.7% of respectively in the study area falls within the medium/intermediate endemic according to the criteria set by WHO while that of hepatitis B and C co-infection was 4%. Thus bringing to light the need to create awareness through health education, proper risk identification, and prompt treatment of diagnosed cases as well prevention of the disease by effective vaccination and immunization program. All of these is aimed at the perceived the increasing maternal and infant morbidity and mortality. Our ultimate aim is to ensure healthy mother and health baby.

Author Contributions

WEC conceived and designed the study. WEC, MKT and AII carried out the field survey. WEC, MKT, DOA, and AII performed the experiments and MKT analyzed the data. MKT and DOA wrote the paper with contributions from WEC and AII. All authors read and approved the final manuscript.

Funding
None

Availability of data and Materials
All data generated or analyzed during this study are included in this article.

Declarations
Ethical approval and consent to participate

Ethical approval and permission to conduct this study were obtained from Health Research Ethics Committee (NHREC-UBTH-HREC/24/12/2022B) of the University of Benin Teaching Hospital with PROTOCOL NUMBER ADM/E 22/A/VOL. VII 14838152176.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interest.

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