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Prevalence of Hepatitis C Virus among Pregnant Women Attending Antenatal Clinic in Idea to South L. G. A, Imo State

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Abstract

In Sub-Saharan Africa, the hepatitis C virus (HCV) is a major public health concern and is extremely prevalent. The purpose of this study was to ascertain the hepatitis C virus prevalence in expectant mothers. Pregnant women who visited antenatal clinics in the Idaeto Local Government Area in 2023 participated in this cross-sectional survey. Using the 4th ELISA method, samples were screened for HCV infection, and SPSS version 23 statistical software was used for data analysis. There were 123 pregnant women in all, and 7 of them (5.6%) tested positive for HCV. Age groups between 30 and 39 (n = 4), educated (n = 4), employed (n = 6), and married (n = 6) were reported to have the highest proportion of HCV. With the exception of employment status ($p > 0.05$), there was no statistically significant correlation found between demographic factors and HCV positive. This study established that HCV infection is a public health concern in pregnant women and shown a significant incidence of the virus.

Keywords: prevalence, hepatitis c virus, pregnant women, Ideato South L.G.A, Imo State.

Introduction

Infection with the hepatitis C virus (HCV) is a serious global public health hazard. It is an infectious disease that has a sneaky onset and obvious pathways of transmission [1]. The World Health Organization (WHO) estimates that 58 million people worldwide, or 0.75% of the total population, are infected with HCV [2]. Infection with the hepatitis C virus (HCV) is a global health concern that is particularly common in Sub-Saharan Africa [3]. In Nigeria, hepatitis C virus (HCV) infection may be among the most frequent illnesses among expectant mothers; globally, HCV infection affects 8% of pregnant women, with a frequency as high as 4% in the US [4].

About 6% of babies born to mothers with HCV viremia will have mother-to-child transmission of HCV during pregnancy, and the risk doubles in the presence of poorly managed HIV coinfection [5]. Mother-to-child transmission of HCV has been disregarded because perinatal hepatitis C infection is a treatable chronic infectious illness with a spontaneous clearance rate of 25–30% [6]. In actuality, though, after an HCV infection is identified, over 80% of infants will exhibit chronic symptoms; of these, 30% will experience clinical symptoms in adolescence or adulthood, and they will also be at a heightened risk of developing liver cirrhosis and hepatocellular carcinoma (HCC) [7].

Furthermore, there is a clear correlation between hepatitis C infection and unfavorable pregnancy outcomes, such as low birth weight, congenital defects, preterm birth, and restricted fetal growth [8]. Therefore, there is a chance that the fetus will be at risk for preterm birth and neonatal death if the mother has HCV infection. Thus, it is critical to comprehend the incidence of HCV in expectant mothers and investigate risk factors. The World Health Organization (WHO) set 2030 as the deadline for eradicating viral hepatitis as a threat to public health, which included a 90% decrease in new infections and a 65% decrease in mortality [9]. As a result, a number of public health and medical associations have lately suggested that all expectant mothers undergo universal HCV screening [10].

There hasn't been much information on HCV infection during pregnancy until recently, and findings on the

virus's impact on pregnancy and postnatal outcomes have been inconsistent. A number of more recent works have attempted to fill up this vacuum in the literature. All of these studies pointed to a rising incidence of HCV infections during pregnancy over the previous 20 years, even though the majority of them only covered a portion of that time. Adverse perinatal events linked to HCV have also been documented in a few studies, although it's possible that these studies did not adequately account for the potential confounding effects of substance use, which is another known risk factor for unfavorable pregnancy outcomes [11].

While there is debate surrounding the efficacy of universal prenatal HCV screening, prenatal HCV diagnosis offers benefits to both mother and child. Prenatal HCV screening aids in the diagnosis of an infection that the mother is unaware she has. Additionally, screening during pregnancy reveals the newborn's exposure status to HCV and offers the chance to manage mother-to-child transmission (MTCT) and other unfavorable fetal outcomes that may be linked to maternal HCV infection [12].

Given that Nigeria lacks guidelines for the regular screening of HCV and health promotion tactics during prenatal care. Since their healthcare practitioners might not have brought up the subject, some pregnant women might not be aware that they are infected with HCV. Furthermore, the majority of infected women might not be aware of their status until an accidental diagnosis of chronic HCV is obtained because HCV infection is typically silent. Considering the likelihood of vertical HCV transmission, the rise in HCV infections in women of reproductive age (Ryerson et al., 2020), and possible adverse effects connected to pregnancy [13]. A deeper knowledge of HCV infection during pregnancy and its effects on outcomes is necessary for physicians and policy makers.

A viral infection known as hepatitis C affects about 1% of women who are fertile. Hepatitis C is most frequently contracted through intravenous drug use, although it is also more prevalent in some immigrant populations and may have been contracted by medical intervention. 2016 saw the widespread availability of Hepatitis C medicines that were effective and had cure rates of above 95%. In order to start therapy and cure Hepatitis C before becoming pregnant, women should be screened for the disease prior to becoming pregnant. Even though the majority of women have an extremely minimal chance of passing on Hepatitis C to their unborn child, taking treatment before becoming pregnant benefits the diseased woman, her unborn child, and health workers by lowering occupational exposure. therapy for women with Hepatitis C after becoming pregnant and finishing breastfeeding should be addressed, but therapy during pregnancy is not advised. Pregnant women with Hepatitis C should receive care from a multidisciplinary team with specific knowledge of infectious diseases. While a newborn with a hepatitis C infection should not be denied breast milk, it is advisable to express and discard the milk until any open wounds have healed if there is nipple cracking or bleeding. But for the purpose of stopping and eliminating this virus, empirical data is crucial. Nevertheless, there are few nationally representative data on HCV during pregnancy

Research Methodology:

Study design

This was a multicenter hospital-based cross-sectional pilot baseline study designed to explore the the prevalence of HCV and factors affecting prevalence rates of HCV among pregnant women.

Study area

Participants were recruited from randomly selected health facilities in Ideato South Local Government of Imo State.

Ethical consideration

Written consent was obtained from all participants before recruitment into the study. Ethical clearance for this study was obtained from the Imo State University in accordance with the medical code of conduct for biomedical research involving human subjects.

Study population

The study was carried out among consenting pregnant women, who were attendees of the antenatal clinic in randomly selected healthcare facilities Ideato South Local Government of Imo State, Nigeria.

Inclusion criteria: Pregnant women registered for their antenatal care in the study sites were eligible to participate in the study.

Exclusion criteria: Non-pregnant women and women whose pregnancy could not be confirmed by ultrasound or blood test were excluded.

Recruitment of participants

The study employed random sampling by selecting six hospitals across Ideato South Local Government Area. Pregnant women were recruited from the antenatal clinics of each hospital over a 1-month (between 2 August 2023 and September, 2023) period. After detailed explanation of the objectives, procedures, and possible benefits of the study, only those who accepted to participate in the study and gave a written informed consent were enrolled into the study. Their blood sample was collected for HCV determination.

Laboratory procedure and analysis

Five milliliters of the blood sample was aseptically collected by venipuncture from each pregnant woman into a plain specimen bottle after consent was sought and obtained. The participant's code, age, education level, occupation and marital status were labeled on the bottle for proper identification. Each of the samples was centrifuged at 3000 r/min for 5 min and the serum portion was used on the test strip for antigen or antibody detection. Sera samples were stored at −25°C in line with the kit

manufacturer's instruction until screened for HBsAg, anti-HIV, and anti-HCV antibodies.
Screening for anti-HCV antibodies was conducted using the enzyme-linked immunosorbent assay (ELISA) kit manufactured by LabACON (Hangzhou Biotest Biotech Company, Ltd., China) which has a specificity of 99.0% and a sensitivity of 99.9% according to the manufacturer's declared figures. The kit has in-built controls. The manufacturer's instruction was strictly followed and executed by trained research assistants in each facility. The results were reported as positive or negative.

Statistical analysis
The data were entered into an Excel 2016 spreadsheet (Microsoft Corporation, Redmond,
WA, USA) and subsequently was imported into Statistical Package for the Social Sciences (SPSS) Version 23.0 (IBM Corp., Armonk, NY, USA). Statistical analyses were performed with SPSS Version 22.0 (IBM Corp.).
The bivariate analysis was performed using a Pearson's chi-square test or Fisher's exact test, whenever appropriate, to compare the demographic characteristics as well as risk factors for HCV and prevalence rates.

Results:

Prevalence of hepatitis C virus among pregnant women attending antenatal
Table 4.1 displays the prevalence of hepatitis C virus (HCV) among pregnant women attending antenatal care. Out of a total of 125 pregnant women, 118 of them tested negative for HCV, which accounts for 94.4% of the population. On the other hand, 7 pregnant women, or 5.6% of the total, tested positive for HCV (Table 1). The data reveals that the majority of pregnant women in this group do not have hepatitis C virus, while a small percentage have tested positive for the virus during their antenatal screening (Figure 4.1).

Table 4.1 Prevalence of hepatitis C virus among pregnant women attending antenatal

HCV Status	Frequency	Percentage
Negative	118	94.4
Positive	7	5.6
Total	125	100

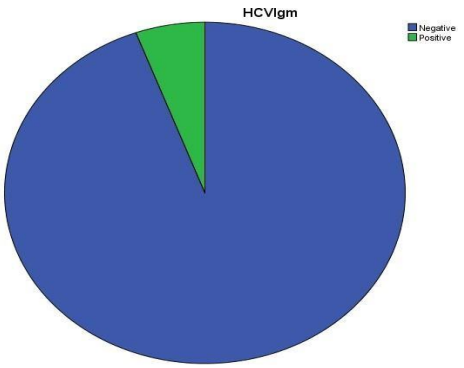

Figure 4.1: Prevalence of hepatitis C virus among pregnant women attending antenatal

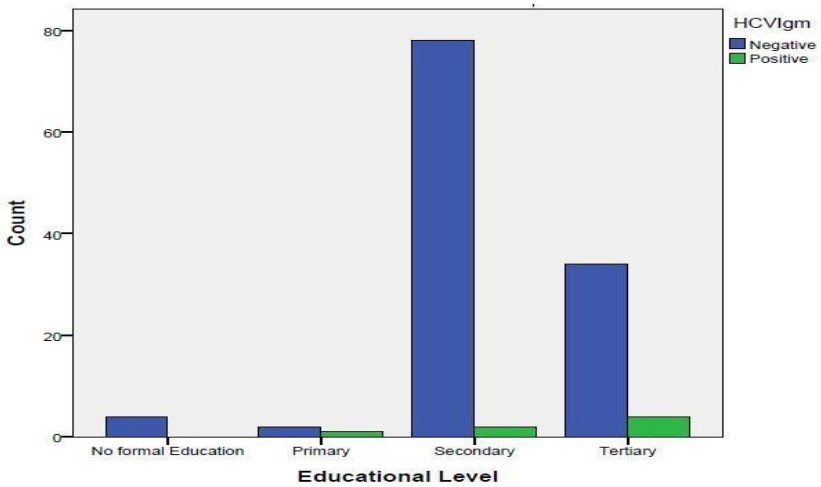

Figure 4.2: Prevalence of hepatitis C virus among pregnant women attending antenatal according to their Educational Level

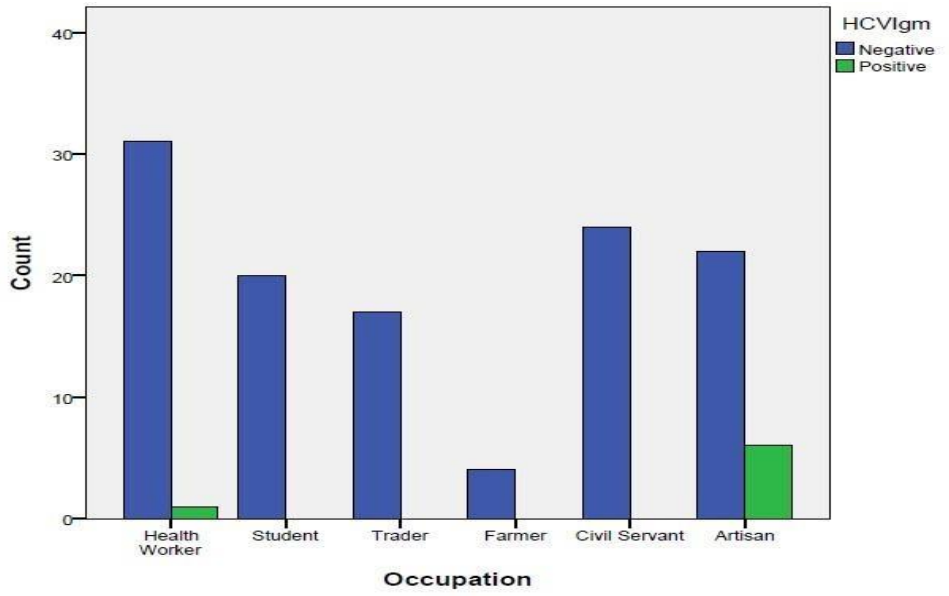

Figure 4.3: Prevalence of hepatitis C virus among pregnant women attending antenatal based on Occupation

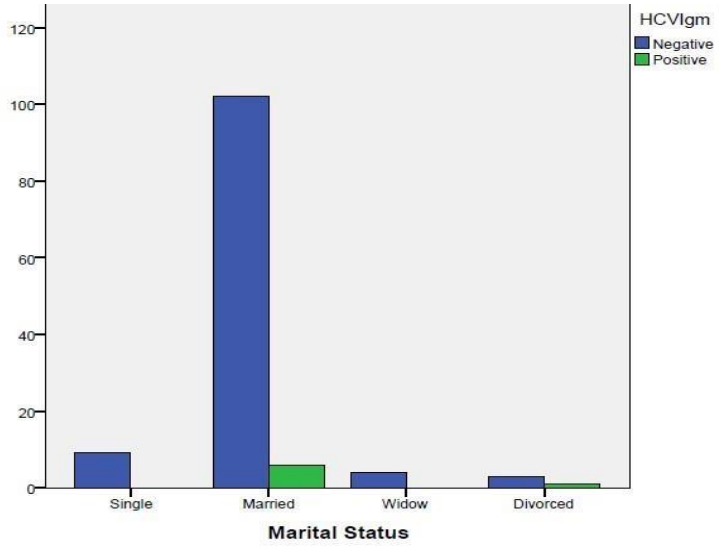

Figure 4.3: Prevalence of hepatitis C virus among pregnant women attending antenatal based on Marital Status

4.2 Association between socio-demographic characteristics and hepatitis C virus among pregnant women attending antenatal

Table 4.2 explores the relationship between socio-demographic characteristics and the presence of hepatitis C virus (HCV) among pregnant women receiving antenatal care.

Among pregnant women aged 18-29, 55 tested negative for HCV, and 3 tested positive. In the 30-39 age group, 4 out of 57 pregnant women tested positive for HCV. In the 40-49 age group, all 10 pregnant women tested negative for HCV. Importantly, the statistical analysis (p-value of 0.660) indicates no significant association between age and HCV status of the pregnant women.

Regarding the participants education, pregnant women with "No formal Education" showed no cases of HCV positivity (4 tested negative). The "Primary" education group had 2 negative cases and 1 positive, but the sample size is small. The majority of pregnant women with "Secondary" and "Tertiary" education levels tested negative. The p-value of 0.50 suggesting there is no significant association between educational level and HCV among pregnant women.

Result on the occupational status and HCV status showed that among "Health Workers," 31 out of 32 tested negative, and 1 tested positive. The other occupation groups, including "Student," "Trader," "Farmer," "Civil Servant," and "Artisan," had mostly negative cases. With a p-value of 0.004, it showed that there is a significant association between occupational status and HCV among pregnant women.

Findings on marital status and HCV status showed that among the "Single" group, all 9 pregnant women tested negative for HCV. In the "Married" group, 102 out of 108 pregnant women tested negative, and 6 tested positive. For the "Widow" and "Divorced" groups, sample sizes are

small, and no p-values are provided. With a p-value of 0.306, the result indicated that there is no significant association between marital status and HCV status among pregnant women.

In summary, table 4.2 provides insights into the relationship between various sociodemographic characteristics and the presence of HCV among pregnant women. The data suggests a significant association between occupational status and HCV positivity. However, for age, education level, and marital status have no statistically significant associations, signifying that these factors do not seem to significantly impact HCV prevalence among pregnant women attending antenatal care.

Table 4.2 Association between socio-demographic characteristics and hepatitis C virus among pregnant women attending antenatal

Variable	Subgroup	HCVIgm Status		Total	p-value
		Negative	Positive		
Age (Year)	18-29	55	3	58	.660
	30-39	53	4	57	
	40-49	10	0	10	
	Total	118	7	125	
Educational Level	No formal Education	4	0	4	.50
	Primary	2	1	3	
	Secondary	78	2	80	
	Tertiary	34	4	38	
	Total	118	7	125	
Occupation	Health Worker	31	1	32	.004
	Student	20	0	20	
	Trader	17	0	17	
	Farmer	4	0	4	
	Civil Servant	24	0	24	
	Artisan	22	6	28	
	Total	118	7	125	
Marital Status	Single	9	0	9	.306
	Married	102	6	108	
	Widow	4	0	4	
	Divorced	3	1	4	
	Total	118	7	125	

Discussion:

The hepatitis C virus prevalence in pregnant women was examined in this study. HCV-caused viral hepatitis is a serious global public health concern and a potentially fatal liver disease [14, 15, 16]. According to WHO data, there are three categories and grades for HCV prevalence: high (>3.5%), moderate (1.5% - 3.5%), and low (<1.5%) [17]. 5.6% of the pregnant women in this research tested positive for HCV, which is consistent with the results of other similar epidemiologic investigations. The study shows that although the hepatitis C virus is classified as having a high prevalence, the majority of pregnant women in this category do not have it. This percentage was greater than the HCV prevalence rates of 2.6%, 3.6%, 2.1%, and 0.6% among pregnant women in Ethiopia, Rwanda, Nigeria, and Gabon, respectively [18,19].

In comparison to earlier studies conducted in Pakistan that reported a high HCV prevalence rate of 10.84%, Egypt that reported an 8.6% rate, and Yemen that reported an 8.5% rate, our results were low [20]. This variation in the population investigated, genetic variables, socioeconomic level, cultural customs, the detection technology employed, regional variations in the risk factors for viral hepatitis, and the size of the group analyzed could all be responsible for this disparity. About the relationship between sociodemographic traits and HCV in expectant mothers. Age and HCV status do not significantly correlate, according to the findings. There is a higher proportion of negative than positive cases across all age groups, and there isn't any compelling evidence that the prevalence of HCV varies considerably by age. The findings are in opposition to research by [21] which concluded that age is a known risk factor for hepatitis C infection and that seropositivity increases till the age of 40 before declining over time. Nonetheless, this might be clarified by the increased likelihood of these women being exposed to risk factors.The status of HCV and education level do not significantly correlate. All levels of education combined; the majority of expectant mothers tested negative for HCV. These results make sense because a woman's age or level of education might not influence her propensity to look for healthcare-related information that could advise her unborn child about the risk factors for HCV. This result is comparable to a prior study conducted

in Nigeria by [22] and a report conducted in Ethiopia by [23]. This finding contradicts the findings of other research that linked higher ages, lower levels of education, and low parity to higher rates of HCV infection [24].
Additionally, there is no discernible correlation between married status and HCV status [25]. The majority of positive cases were found among "Married" pregnant women; however, the p-value of 0.306 indicates that this difference is not statistically significant. There were no HCV positive instances among "single" women, although the sample size was tiny. With a p-value of 0.004, the results show a strong correlation between pregnant women's occupation and HCV. Pregnant women are more likely to have a risk factor in their occupation; nonetheless, in comparison to other study groups, being a health worker or artisan increases the likelihood of testing positive for HCV [26, 27]. Among the sociodemographic traits, employment, and more especially being employed, stand out as being highly connected with HCV positive. This implies that pregnant artists and healthcare professionals may be more vulnerable to HCV infection.

Conclusion

To sum up, the findings provide important information about the incidence of hepatitis C virus (HCV) in expectant mothers receiving prenatal care as well as how it relates to other sociodemographic traits. According to the study's findings on the prevalence of HCV in expectant mothers, 94.4% of them tested negative for the virus, while just 5.6% of them tested positive. In terms of the health of the mother and the fetus, this indicates that HCV is not very common among these pregnant women.
Key conclusions were shown by the sociodemographic characteristics. According to this study, age did not significantly affect the prevalence of HCV among pregnant women. Positive instances were less common than negative cases across all age groups. Given that most pregnant women regardless of education level test negative for HCV, education level also does not appear to be a significant influence in HCV prevalence. Because only pregnant women in this category had positive status, it is possible that pregnant health workers and artisans are more susceptible to HCV infection. The occupational status was shown to be substantially correlated with the prevalence of HCV. There was no discernible correlation between marital status and the prevalence of HCV. Despite having the greatest number of positive cases, "Married" women did not significantly vary from other groups, according to the statistical study.

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