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Prevalence of Hepatitis C virus infection among pregnant women attending a hospital in Obinze, Imo state Nigeria

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Abstract

Background: Hepatitis C Virus (HCV) infection has grown to be a serious global public health concern, especially in pregnant women. Despite this, it is often neglected in developing nations. This study assessed the incidence and seroprevalence of HCV infection among pregnant patients at a hospital in Obinze, Imo State, Nigeria, and the relationship between HCV infection and sociodemographic characteristics.

Case: One hundred and twenty pregnant women participated in this study. Standard serological techniques were used to screen blood samples for HCV antibodies, and information on age, marital status, educational attainment, and employment was gathered. The frequency and distribution of HCV across sociodemographic categories were ascertained by descriptive and comparative studies.

Result: This study showed that 14.2% of people had an HCV infection overall. With 82.4% of the population, married women made up the bulk of positive cases. Married women between the ages of 31 and 40 had the highest frequency (20.8%). The infection rate was higher among those without formal education (20.0%). Traders were the most prevalent occupation (18.5%), followed by artisans (15.6%). Nigerians' health is seriously at risk due to the country's disregard of HCV screening, prevalence, and treatment. According to the study, pregnant women in Obinze had a significant incidence of HCV infection, especially among particular sociodemographic categories.

Conclusion: To lessen the burden of HCV in this group, targeted public health initiatives are desperately needed. These include regular prenatal screening, information on HCV transmission, and treatment availability. In order to have a better understanding of the patterns of HCV transmission in the area, more studies using bigger, community-based samples is recommended.

Keywords: Hepatitis C virus; Prevalence; Pregnant women; Obinze; Nigeria.

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Introduction

Hepatitis C Virus (HCV) infection, caused by an RNA virus belonging to the Flaviviridae family like the Human Immunodeficiency Virus (HIV) has become a significant worldwide public health issue [1,2]. In contrast to HIV, it is a serious public health concern that has a substantial influence on maternal and newborn health, especially in pregnant women, although it is frequently neglected and undiagnosed in many poor and developing nations. In sub-Saharan Africa, this public health burden is mostly considered a silent killer illness [3,4], due to the manner with which it affects and kill people undictated. Assefa et al. [5], reports that the Hepatitis B and Hepatitis C viruses are the most common causes of viral hepatitis worldwide. It has been linked to fatalities and severe, lifelong illnesses such cirrhosis and hepatocellular cancer [6].

In Nigeria, pregnant women may be susceptible to Hepatitis C Virus (HCV) infections [7]. Around 8% of expectant mothers worldwide are infected with HCV, and in the US, the frequency might reach 4% [8]. Pregnancy-related viral hepatitis is linked to a significant risk of difficulties for the mother, foetus, and newborn, including low birth weight, abortion, stillbirth, and pre-term birth [3,9]. Chronic HBV and HCV infections impact about 248 million and 150 million people globally, respectively, and cause 780,000 and 350,000 deaths annually [5,10].

The main parenteral routes through which the hepatitis C virus is spread are through infected blood transfusions, intravenous drug use or blood products, therapeutic injections, intravenous drug use, acupuncture, tattooing, ear piercing, and vertical transmission from mother to child and during sexual contact [3,11-16]. According to Fauteux-Daniel et al. [17], approximately 10% of hepatitis infections can also be vertically passed from mother to child. Although there is a 3-10% chance of mother-to-child HCV transmission, nothing is known about the exact timing and mode of transmission [15]. Although there is currently no authorized treatment for Hepatitis C Virus (HCV) infection during pregnancy, interventions that target women directly, particularly those between the ages of 15 and 49, may be able to stop vertical transmission and community spread [18]. Therefore, it is advised to implement a regular HCV prenatal testing programme in order to address this public health issue among the younger population especially in rural areas.

Hepatitis C Virus (HCV) infection is widespread in sub-Saharan Africa [6]. Depending on the country, the general population's HCV prevalence varies from 0.1% to 17.5% [19]. In Addis Ababa, Ethiopia, the population's overall prevalence of HCV was 0.9%, with 1.3% of people over 15 years of age having the virus [20]. According to studies carried out in particular sub-Saharan African nations, the incidence of HCV in central African nations is significant (6.0%). Egypt has the greatest HCV prevalence in North Africa (17.5%), followed by Morocco (7.7%). In underdeveloped nations like Nigeria, pregnancy-related HCV is mostly ignored, despite advancements in the pathophysiology, treatment, and public health response to the virus, particularly from the World Health Organization. There is a 2-8% chance that an HCV infection may spread to other women [21]. A study on pregnant women in Nigeria, showed that the prevalence of HCV was 11.1% for women under the age of 20 and 1.4% for those between the ages of 20 and 35 [22]. The prevalence of

Hepatitis C Virus (HCV) infection in pregnant women has been rising over the past few decades [23]. The World Health Organization (WHO) has established a proactive plan to eliminate hepatitis as a major public health threat by 2030 [10], reduce 50% MTCT of HBV, and have less than 0.1% HBsAg in children by 2020. Both the mother and the foetus benefit from screening for hepatitis during pregnancy, and prophylactic treatment is generally advised for those who test positive [3,10]. Due to a lack of a screening programme, diagnostic kits, and treatment costs, there was no national data on the prevalence and awareness of Hepatitis C virus infection among pregnant women in Nigeria until recently [7]. Additionally, there is no data available for pregnant women in Obinze, Imo state. In Obinze, Imo State, Nigeria, the antenatal care services do not include hepatitis C virus screening. This study was carried out to ascertain the prevalence of Hepatitis C virus infection in pregnant women in Obinze, Imo State, Nigeria, as well as to identify risk factors and sociodemographic characteristics linked to the virus as part of the efforts to achieve the WHO goal.

Materials and methods

Study area

The study was conducted at the St. John's Hospital, Obinze, in Imo State, Nigeria over a period of 6 months from March 2024 to August 2024, to determine the prevalence of Hepatitis C among pregnant women attending Antenatal clinic of the hospital which provides health care services to patients within and outside Obinze community, Imo state. An informed consent was taken from all participating pregnant women prior to collection of samples. A pre-designed questionnaire was used to determine the socio-demographic profile of the enrolled participants such as age, marital status, educational qualification, occupation, patients living accommodation, history of blood/blood product transfusion, scarification, history of surgery, injection by unqualified medical personnel, use of contraceptives, gestation age and gravidity.

Inclusion criteria

Apparently healthy pregnant females attending Antenatal clinic who were screened for Hepatitis C and who gave their consent were included in this study.

Exclusion criteria

All pregnant women who did not give their consent were excluded from the study.

Study population and selection

A total of one hundred and twenty (120) pregnant women aged 18 years and above who visited the hospital and consented to participate in the study within the period of study were selected and screened.

Ethical consideration: The study was approved by Hospitals Ethical Committee before commencing the study.

Sample collection

Five milliliters (5 mls) of venous blood samples were aseptically collected from the patients enlisted for the study using disposable sterile syringes with needle through venipuncture and

put into Ethyl Diaminetetracetic Acids (EDTA) bottles, allowed to stand for one hour (1 hr) to clot at room temperature and then centrifuged at 3000 rpm for 15 minutes using a centrifuge. For whole blood, five milliliters (5 mls) of venous blood samples were aseptically collected from the patients into a container without anticoagulant. Specimen not tested on the day of collection, was stored in a refrigerator or freezer and brought to room temperature before testing.

Laboratory analysis

Standard Hepatitis C rapid test kit (Micropoint Cassette, Sun-long Biotech Co. Ltd China) was used and the test was carried out according to the manufacturer's instruction. The whole blood specimen was diluted 50 times with diluents. (e.g. 10 µl of specimen add 490 µl of diluents). A pouch containing a cassette was opened; the test kit was removed from the pouch and placed on the desk horizontally. A drop of diluted specimen was pipetted into the sample well of the cassette. Results were read within 10-15 minutes.

Data analysis

All statistical analyses were performed using SPSS for window versions 20.0 (SPSS Inc. Chicago II, U.S.A)

Results

Table 1: Prevalence of HCV according to Age. Prevalence of HCV according to Age.

Age	No Examined (%)	No Positive (%)
≤20	18(15.0)	1(5.6)
21-30	40(33.3)	5(12.5)
31-40	48(40.0)	10(20.8)
41-50	12(10.0)	1(8.3)
51-60	2(1.7)	0(0.0)
Total	120(100.0)	17(14.2)

Table 2: Prevalence of HCV according to marital status.

Marital status	No Examined (%)	No Positive (%)
Single	11(9.2)	1(9.1)
Married	99(82.5)	14(14.1)
Divorced	7(5.8)	1(14.3)
Widow	3(2.5)	1(33.3)
Total	120(100.0)	17(14.2)

Table 3: Prevalence of HCV according to educational level.

Education Level	No Examined (%)	No Positive (%)
None	10(8.3)	2(20.0)
Primary	41(34.2)	6(14.6)
Secondary	44(36.7)	6(13.6)
Tertiary	25(20.8)	3(12.0)
Total	120(100.0)	17(14.2)

Table 4: Prevalence of HCV according to occupation.

Occupation	No Examined (%)	No Positive (%)
Farmer	11(9.2)	1(9.1)
Trader	27(22.5)	5(18.5)
Civil servant	23(19.2)	3(13.0)
Student	14(11.7)	1(7.1)
Artisan	45(37.5)	7(15.6)
Total	120(100.0)	17(14.2)

Discussion

This study assessed the prevalence of HCV infection among pregnant women attending a hospital in Obinze, Imo State, Nigeria, taking into account sociodemographic factors like age, marital status, educational attainment, and occupation. The data showed that the highest prevalence of HCV infection was among pregnant women aged 31-40 years (20.8%), followed by those aged 41-50 years (8.3%), followed by those in the 21-30 age group (12.5%), and pregnant women aged 51-60 years did not have any infections. The age group of 31-40 years old had the highest prevalence, which is consistent with studies Wasuwanich et al. [23] who cited that people in their reproductive and working years are more vulnerable because of increasing exposure to health care systems and potentially harmful medical procedures. The findings of this study highlight the fact that the prevalence of Hepatitis C Virus (HCV) infection among pregnant women who visit hospitals varies greatly by region. For example, studies conducted in India have found that the prevalence among pregnant women who visit various antenatal clinics in hospitals ranges from 0.5 to 1.25 percent [24-26], while in Pakistan, the prevalence ranges from 4.6 to 10.9% [27,28]. These statistics climbed up to 8.6% in Egypt [29] and 6.8% active infection (HCV- RNA) among pregnant women at Benha University Hospital, Egypt. It nonetheless, revealed a modest rate, with 1.0-4.6% in Nigeria [1,12,30-32] and 2.7% in Ghana [21].

The 14.2% prevalence of Hepatitis C virus infection found in this study is the same as the 14.2% seen in patients at Aminu Kano Teaching Hospital in Kano, Nigeria, as reported by Nwoke-di et al. [33]. Nonetheless, the study's 14.2% rate is more than the national frequency of 2.2% in 2013 [34]. Previous studies in various population subgroups in Nigeria, some African and Middle Eastern countries have recorded varying prevalence rates of HCV [35]. Low HCV prevalence rates were recorded among blood donors in Kano, Nigeria (3.4%), Namibia (3.9%), Sudan (4.9%), Senegal (5.8%), and Ghana (6.9%) [36]. Data obtained in healthcare settings have been associated with a higher prevalence due to symptomatic individuals who are likely to contribute significantly to the subjects tested, as opposed to community-based studies, which primarily comprise apparently healthy individuals. However, some earlier studies in Nigeria found higher prevalence rates: 14.5% among Benin patients with sickle cell disease who regularly receive blood transfusions, 15.7% among HIV patients in Jos, 18.0% among university undergraduates in Ilorin, 15.0% in Port-Harcourt, and 17.3% in Benin [37].

The majority of HCV-positive patients (14.1%) were married women, which is consistent with other results [1 and 15]. This is because married women made up 82.5% of the sample. Nonetheless, widows had the greatest proportionate prevalence (33.3%), which may indicate prior exposure to risk factors including marital transmission or blood transfusions. The low prevalence (9.1%) among women who are single may be

related to their reduced exposure to risk factors, such as delivery or surgery. The distribution of HCV across educational levels is comparatively consistent, according to the statistics. Despite being underrepresented in the sample, women without formal education had the greatest proportionate occurrence, at 20%. Better access to health information and preventative actions may have contributed to the somewhat lower incidence among tertiary- educated women (12.0%) compared to the total prevalence (14.2%). This supports earlier research conducted in western Ethiopia [15].

According to Jeremiah et al. [35], prevalence rates among blood donors in Ghana, Saudi Arabia, and Egypt were 15.2%, 15.7%, and 19.2%, respectively. There are a number of possible causes for these discrepancies in prevalence rates. First, it might accurately represent the global regional variation in HCV prevalence due to the high risk of exposure in the specific population subgroup under study, such as sickle cell disease patients, HIV/AIDS patients, commercial blood donors, etc., or because of the prevalent unhealthy health practices in such areas [38]. Secondly, the discrepancies in diagnostic methods and the accuracy of the many assays employed in the study can be the cause. Third, given that the majority of the participants in our study were between the ages of 21 and 40, it may be a reflection of the birth cohort effect on illness prevalence, that is, the influence of the recent general improvement in health practices on disease prevalence [38].

We found that the prevalence of HCV rose with age, peaking in patients between the ages of 31 and 40 after late adolescence. This conclusion is consistent with other previous [19,39], that revealed increased HCV antibody seroprevalence in the elderly, and it is not surprising given that Hepatitis C is linked to persistent infection with the development of chronic liver disease. These results are supported by Ya'aba et al. [40], who discovered that the highest frequency of Hepatitis C was reported in people between the ages of 26 and 45 in four medical institutions in Abuja, Nigeria. Nwokedi et al. [33] found that the highest HCV antibody seroprevalence was found in those between the ages of 31 and 40, and that prevalence steadily decreased as people aged.

The greatest percentage of HCV-positive cases (15.6%) were found in artisans, possibly as a result of their exposure to unsterilized equipment or unsanitary surroundings. The prevalence of traders was 18.5%, which may be related to their restricted access to healthcare and frequent contact with a variety of groups. The prevalence was lowest among students (9.1%), which may be related to their younger age and less exposure to high-risk procedures. The study shows an overall prevalence of 14.2%, which is comparable to results from other resource-constrained situations in Nigeria and higher than the global norm (about 2.5%). The necessity for focused interventions, such as routine screening during prenatal care, education on HCV transmission, and safe medical practices, is highlighted by the high incidence among particular populations, such as widows and craftsmen. Furthermore, the age distribution indicates that women in their reproductive years are a crucial group for preventative measures. Notwithstanding the fact that HCV is a blood-borne virus, it was found that, when taking into account clinical risk factors, the seroprevalence among people who have received blood transfusions or donations, injected drugs, had piercings, tattoos, engaged in unprotected sexual activity, been incarcerated in the past, or had sex with men who have sex with other men is statistically significant. In this study, 7.7% of re-

search participants who had previously received blood transfusions were positive for HCV. Blood and blood products have been widely identified as possible routes of HCV virus transmission. The current study identified tattooing and exchanging personal goods, such as sharp tools that might be contaminated with infected blood, as risk factors for HCV. Blood transfusions have also been found to be a predictor of HCV infection, and the danger of HCV infection remains a serious occupational hazard.

Conclusion

According to our findings in this study, pregnant women in Obinze, Imo State, Nigeria, are significantly burdened by the prevalence of Hepatitis C Virus infection. The study offers further information on the illness burden in Nigeria, despite its limitations related to sample size and hospital-based methodology. Exposure to infectious blood is the most common way that the Hepatitis C virus is spread. This can happen through receiving contaminated blood, receiving blood products from transfusions, receiving organ transplants, receiving injections using contaminated syringes and needles, getting a needlestick injury in a medical facility, receiving an intravenous injection of an illicit drug, or being born to a mother who has the virus. In order to minimize mother-to-child transmission and lower the overall frequency in the community, addressing this issue calls for a coordinated effort that includes improved screening, public health education, and easier access to antiviral medicines. Because HCV poses a major risk to the health of Nigerians, it must be given the same priority as HIV screening, prevalence, and treatment. In Nigeria, routine Hepatitis C surveillance is required, and everyone who tests positive for HCV should receive the appropriate care.

Declarations

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Ethical approval: The study was approved by the Hospital ethics committee.

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