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SEROPREVALENCE OF HEPATITIS C SURFACE ANTIGEN AMONG WOMEN ATTENDING ANTENATAL AT GENERAL HOSPITAL BOGORO, IN BAUCHI STATE NIGERIA

Nazeef Idris Usman,

¹Department of Microbiology, Bauchi state University Gadau <u>iunazeef@basug.edu.ng</u> 08066918308

Wada Nafiu Muhammad,

Department of Science Laboratory Technology, Federal Polytechnic Bauchi wadanafiu@gmail.com 08032091228

Zakaria Shekarau,

Department of Microbiology, Bauchi State University, Gadau ZakariaShekarau@gmail.com 08033686291

Hadiza Mustapha Ghazali

Department of Science Laboratory Technology, Federal Polytechnic Bauchi Mustaphahadiza77@gmail.com 08036458677

Abstract

Hepatitis C virus (HCV) infection is a major public health problem which could easily lead to chronic liver disease and Cirrhosis. A study aimed to determine the seroprevalence of HCV surface antigen among women attending antenatal at general hospital Bogoro was conducted. A total of 200 samples comprising of all women attending antenatal were screened using HCV antigen-antibody reaction strip between 12 June- 2nd September, 2017, samples were screened as they are collected. Out of the screened patients, 13 (6.5%) were positive for HIV infection. The seroprevalence with respect to age group indicates that those within the age of 19-25 years and ≤ 18 years had the highest prevalence rate of 3.0% and 1.0% respectively. More so, those that fall within the range of 19–25 (3.0%) were more infected compared to their other counterparts. Prevalence according to tribes indicate higher occurance in Sayawa with 3.5% followed by Hausa 1.0%, Boiyawa 1.0% and those with least infections are the Fulani 0.5% and Jarawa 0.5%. Occurance rate by marital status show that the married have 4.0% followed by the single 2.0% while the divorced have 0.5%. According to religion, the Christian showed the highest prevalence of 4.0 % followed by the Muslims counterpart 2.0%. It is concluded that the seroprevalence of HCV in women attending Borogo hospital is greater than the world health organization (WHO) estimate of 2.0% for Nigeria. Thus, public awareness programme to orient the women on modes of transmission should be encourage. This research work provided baseline data for further research in the near community.

Keywords: Hepatitis C, Seroprevalence, Bogoro, Bauchi

Introduction

Viral hepatitis refers to a set of at least six viruses that are known to cause hepatitis; Hepatitis A,(HaV), Hepatitis B(HbV),Hepatitis C (HcV),Hepatitis D (HdV),Hepatitis E (HeV) and hepatitis G(HgV) (Hahn et al.,2007) Hepatitis c virus(HcV) is a single-stranded RNA which until 1989 was named non A non B hepatitis (Imarcnezor *et al.*, 2010).Hepatitis C infection in a major and growing public health problem which could easily lead to chronic liver disease, cirrhosis and even hepatocellular carcinoma (Alter, 2007). It is a common serious complication of blood transfusion and is recognized as an important viral disease in the tropical countries. The infection is often asymptomatic, but once established, chronic infection can progress to scarring (cirrhosis) which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure or other complication of cirrhosis, including liver cancer or life-threatening oesophageal varices and gastric varices. Transmission can be through bodily secretion such as saliva, sweat, urine as well as blood and blood product; even barbers while shaving may be accidentally exposed to the blood and bodily fluids of their customers (Adoba *et al.*, 2015).

Most of the people have few, if any symptoms after the initial infection, yet the virus persists in the liver in about 85% of those infected. Persistent infection can be treated with medication, interferon and ribavirin being the standard-of-care therapy (Baldick *et al.*, 2010) those who develop cirrhosis or liver cancer require a liver transplant, and the virus usually recurs after transplantation. The rapid global spread of hepatitis C virus is believed to have occurred primarily because of efficient transmission through blood transfusion and parenteral exposures with contaminated equipment (Prati, 2006). In a related study blood donor, particularly those that rely on blood donation as a source of income had a very high prevalence of hepatitis C virus infection (Chen and Jiang, 2009).

Recent scientific evidence also suggests the existence of other as yet unidentified hepatitis are A, B, and Hepatitis C and B cause permanent liver damage and lead to the patient. There is two primary type of viral hepatitis, liver borne and blood-borne hepatitis, the former is spread through contaminated food and water, cannot cause chronic liver disease. By context, the blood-borne viral hepatitis may lead to long-term, persistent infection and chronic liver disease. The lethal consequence is many years after infection (Jain *et al.*, 2003). More so, Hepatitis C Virus (HcV) has been shown to have a worldwide distribution, occurring among person of all ages, gender, races, and region of the world. This study, therefore, aimed to determine the prevalence and associated sociodemographic factor for hepatitis C virus infection among women attending antenatal at general hospital Bogoro, Bauchi state in northern Nigeria.

Chronic hepatitis due to different hepatitis virus is a common cause of liver-related mobility, while infection with multiple viri that causes hepatitis has been associated with several serious complications (like cirrhosis, liver failure, and hepatocellular carcinoma) and this complication lead to management problems with higher incidence of morbidity and mortality (Zuberi *et al.*, 2008). In short, infection with hepatitis C virus (HcV) is a problem that is important to global public health and present significant causes of morbidity and mortality worldwide.

According to the World Health Organization (WHO), approximately 170 million are currently infected with HcV, and are a risk of developing cirrhosis and hepatocellular carcinoma (Scaraveli *et al.*, 2011). Also, pregnant women are known to indulge in risky behaviors that easily predispose them to acquire this viral infection. This represents a significant problem.

In developing societies like Nigeria, the health care system is not thorough enough to detect individuals infected with Hepatitis C as a patient presenting to the different hospital are not screened for this virus but are rather screened for HIV. As a result, people in these areas are at a greater risk of infection and carries and infected individuals are more likely to be unaware of their status (CDC, 2009; Adekeye et al., 2013). Such research work is warranted as it aimed at providing baseline data for further research, public health policy formulation, and awareness campaign for the need to know one's hepatitis status especially in an endemic area like Nigeria. More so, the women though consider enlightened are involve in one risky behavior or other, which exposes them to this infection. In view of that, this research will create awareness about the health implication of hepatitis C virus infection. Thus, the aim of this study is to determine the seroprevalence of hepatitis C virus among women attending antenatal at general hospital Bogoro L.G.A in Bauchi state. The aim was to achieve by determining the seroprevalence of HcV among women attending antenatal at general hospital Bogoro using HcV determine strip. Determine the age distribution of HcV infection among the studied subjects. Determine the possible socio-demographic factors associated with hepatitis C virus infection.

Materials and Methods

This work was carried out in the laboratory of General Hospital Bogoro, in Bauchi State. Bogoro is Located in the southern part of Bauchi state in Nigeria. It is geographically situated on a latitude $5^{0} 8^{0} S$ and longitude $7^{0} 52^{0} N$. It is 79km away from Bauchi the capital city of Bauchi (Audu *et al.*, 2007)

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Study Population

The study population for this particular research is two hundred women attending antenatal at general hospital Bogoro, in Bauchi state. Women attending antenatal at general hospital Bogoro for healthcare were selected randomly for the study. The women were randomly selected so as to avoid influencing the outcome of the identified risk factors.

Sample size

The sample size for this research determined using the formula of (Victor *et al.*, 2007) at 95% significance level and a reported prevalence of 15.4% Prevalence of 15.4% for disease presence

 $N = \frac{Z^{2} (P) Q}{L^{2}}$ Where N= Sample size

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Z= Statistics for a level of 95% confidence interval = 1.96

Pexp= expected the prevalence of the disease from previous studies = 15.4% respectively

L = level of significance (allowable error) = 5% or 0.05

$$Q = 1-p$$

$$N = (1.96^{2}) \times 0.154 \times (1-0.154)$$

$$(0.05)^{2}$$

$$= \frac{3.8416 \times 0.154 \times 0.846}{0.0025}$$

$$N = 200.42$$

To minimize error and occurrence of the result by chance, a total of 200 samples were

collected for the research

Sample Collection

Two (2) ml of blood was collected from 200 women attending the hospital antenatal care around 12 June- 2nd September, 2017 using syringe and transferred into plain tubes were

labeled with a code; no name was used as to ensure confidentiality. The serum was pipetted into sterile EDTA container which was kept in the refrigerator until ready for use.

Test procedure

The serum and test strip were all bought at room temperature. The strip was inserted into the specimen for 10 seconds laid on a flat, clean, dry and non-absorbent surface. The results were read visually after 15 minutes.

Interpretation of Result

The presence or absence of HcV was determined by the presence or absence of colored lines on the test device. In a reactive or positive test result, a red colored line will appear in the control region (C) and another in the test region (T). The non-reactive or negative test result was indicated by only one red line in the control region (C) and no apparent red line was seen in the test region (T). In an invalid test result, the red line failed to appear in the control region, but the red line was seen in the test region in some cases. The intensity of the red color in the test device depends on the concentration of HcV present in the specimen. Therefore, any shade of red in the test region (T) was considered positive. No visible band at all only one colored band appears on the test region, this is an indication of a possible error in performing the test.

Ethical Consideration

The research proposal was assessed by the Research Ethics Committee of General Hospital Bogoro. Permission to carry out the study was also obtained from the Head of Laboratory in general hospital Bogoro. An informed consent was also granted by the antenatal women that volunteered to participate in the study and the screening was done at no cost whatsoever to them. All information obtained was used solely for the purposed of this research and the women's privacy was treated with utmost confidentiality.

4.0 RESULTS

4.1 Seroprevalence of Hepatitis C Virus (HcV) Among Women Attending Antenatal According to their Ages.

Out of the 200 samples screened, 13 (6.5%) were positive for HcV infection. The seroprevalence of the infection with respect to their distribution in terms of ages indicates that those in the age of 19 - 25 years had the highest prevalence rate of 3.0%, followed closely by those aged, <18 years (1.5%). More so, the other age bracket had a comparable prevalence rate, thus 26 - 32 (1.0%), 33 - 39 (0.5%) and 40 and above (0.5%) as shown in Table 1. Risk factors may be marital and extramarital contact, as most of the positive patients were above 19 years.

4.2 Seroprevalence of Hepatitis C Virus (HcV) Among Women Attending Antenatal According to their Tribes

Table 2, the seropositivity of HcV in terms of tribes indicate that the Sayawa had the highest prevalence rate of (1.0%), other tribes had a comparable prevalence rate thus, Boiyawa (1.0%), Fulani (0.5%), Hausa (1.0%), Jarawa (0.5%). This may be articulated to cultural etiquette and variations, hygiene and sanitary majors may determine the occurrence rate.

4.3 Seroprevalence of Hepatitis C (HcV) Among Women Attending Antenatal According to their Marital Status.

Marital status taken in relation to seroprevalence of HcV in married women shows that married women had the highest seropositivity (4.0%) compared to those that were single (2.0%) and divorced (0.5%) as presented in table 3

4.4 Seroprevalence of Hepatitis C (HcV) Among Women Attending Antenatal According to their Religion.

Table 4, show that the prevalence in relation to their religion revealed that the Christians had the highest infection rate of (4.5%), followed by the Muslims (2.0%) and others had no case of HcV infection; this could be due to the paucity of the subject screened in this level.

4.5 Seroprevalence of Hepatitis C (HcV) Among Women Attending Antenatal According to their Level of Education.

The prevalence in relation to educational levels reveals that the women in tertiary level had the highest infection rate of (4.5%), followed by those in primary (1.0%). More so, the others had a comparable prevalence rate thus, those in secondary school (0.5%) and none (0.5%). (Table 5)

Tables

Table 1: Seroprevalence of Hepatitis C Virus (HcV) Among Women AttendingAntenatal According to their Ages.

Age groups (%)	Number Exan	nine Number positive	Prevalence
=<18	42	3	1.5
19 – 25	66	6	3.0
26 - 32	43	2	1.0
33 - 39	24	1	0.5
>=40	25	1	0.5
Total	200	13	6.5

Table	2:	Seroprevalence	of	Hepatitis	С	(HcV)	Among	Women	Attending	Antenatal
Accord	ling	g to their Tribes.								

Tribes	Number Examined	Number positive	Prevalence (%)
Boiyawa	36	2	1.0
Fulani	23	1	0.5
Hausa	47	2	1.0
Jarawa	5	1	0.5
Sayawa	89	7	3.5
Total	200	13	6.5

Marital status	Number Examined	Number positive	Prevalence percentage
Single	73	4	2.0
Married	118	8	4.0
Divorced	9	1	0.5
Total	200	13	6.5

 Table 3: Seroprevalence of Hepatitis C (HcV) Among Women Attending Antenatal

 According to their Marital Status.

 Table 4: Seroprevalence of Hepatitis C (HcV) Among Women Attending Antenatal

 According to their Religion.

Religion	Number Examined	Number positive	Prevalence (%)
Muslims	82	4	2.0
Christians	117	9	4.5
Others	1	0	0
Total	200	13	6.5

Table 5: Seroprevalence of Hepatitis C (HcV) Among Women Attending AntenatalAccording to their Level of Education.

Education	Number Examine	Number Positive	Prevalence percentage
Primary	44	2	1.0
Secondary	21	1	0.5
Tertiary	113	9	4.5
None	22	1	0.5
Total	200	13	6.5

Discussions

This study determines the seroprevalence of hepatitis C virus infections among women attending antenatal, in the southern part of Bauchi State. In this study, 13 (6.5%) of those screened were seropositive to HcV infection. The seropositivity obtained from this study is comparable to the 4.5% reported among antenatal women at general hospital Bogoro, Bauchi State, Nigeria (Udeze *et al.*, 2011), 4.0% in Maiduguri (Dawurung *et al.*, 2012) 6.3% reported among women attending antenatal in Wukari, North Eastern Nigeria (Imarenezor *et al.*,

2016), 4.7% from the University of Uyo teaching hospital Southern Nigeria (Mboto and Edet, 2012). Although it is higher than the 2.0% estimated HcV carriers in the general population of Nigeria (WHO, 2012). Interestingly, lower seropositivity of 1.5% was reported among women in Saudi Arabia by Al-Ajlan (2011). Although Isa and co-workers (2016) recently reported a low prevalence of 1.0% from women in Maiduguri, but it is lower than the prevalence of 6.0% and 10.0% among women attending antenatal at state specialist hospital Maiduguri and University of Maiduguri Teaching Hospital (Isa *et al.*, 2014: Isa *et al.*, 2015). Age distribution of the seroprevalence indicates that the younger women were more infected, for instance, the highest seropositivity of 9.1% and 7.3% was found among those age 19 - 25 and ≤ 18 years respectively. This corroborates the report of Isa *et al.*, (2016), but is in sharp contrast to those of Ejele *et al.*, (2006), Ayolabi (2006) and Okonko *et al.*, (2009) who reported the highest prevalence of HcV antibodies among the age group of 30 - 39 tears. The pattern of the infection in this study with age denotes that younger women are more prone to infection by HcV because of the fact that they can easily indulge in risky behaviors which predisposes them to infection by this virus.

Inyama *et al.*, (2005), reported that married women with a seroprevalence (3.5%) were more infected than the students (1.0%). This might be due to the higher number of women in that stage that participated in this study. This observation is contrary to those of Isa *et al.*, (2014), who reported that women (3.5%) had a higher prevalence of HcV antibodies than women (4.6). However, this study agrees with Mustapha et al., (2007), Isa *et al.*, (2014) and Imarenezor et al., (2016) that women had a higher prevalence to HcV antibodies. In the same note, Akyala *et al.*, (2013) reported a higher prevalence in women which conform to the finding of this present study.

In this study also, women of different marital status are considered those are married were more infected having a seroprevalence of 4%. This result agrees with the findings of Isa *et al.*

(2014) who reported that women that are married had a higher prevalence than others. Therefore, religion was also considered and those that had high infection were the Christians 4.5%. Pennap *et al.* (2010) had earlier demonstrated the contribution of religion which he had a higher prevalence of the virus in his findings.

In line with (Mustapha *et al.*, 2007) women with seroprevalence of 4.5% in the tertiary level have the higher infection followed by the one with primary qualification (1%) all other have a comparable prevalence. This corresponds with the works of (Isa *et al.*, 2014) but there is total disagreement with the works of (Mboto *et al.*, 2012) which he records a very low seroprevalence of HcV infection in women attending antenatal at specialist hospital Makurdi in Benue State.

Conclusion

Hepatitis C virus infection is a major and growing public health problem which could easily lead to chronic liver disease, cirrhosis, and even hepatocellular carcinoma. It is a cosmmon serious complication of blood transfusion and is recognized as an important viral disease in Nigeria. The infection is often asymptomatic, but once established chronic infection can progress to liver damage and even death. The result of this study pinpointed the serological evidence of HCV antibodies among women attending antenatal at general hospital Bogoro, in Bauchi State. Out of two hundred (200) serum samples tested in this study, about 13(6.5%) was found to be positive. In this also, socio-demographic variables such as age, tribe, religion, marital status and level of educational qualification were considered statistically significant in this study.

Recommendations

The result of this study shows that the Seroprevalence of HCV (6.5%) is high higher than the estimated average prevalence rate in the general population of Nigeria. Most of these women do not know much about viral infection, it's mode of transmission, treatment, prevention, and

control hence the high prevalence rate recorded in this study population. We recommend that adequate screening should be regularly conducted to prevent further infection. The women should orient on modes of transmission and prognosis of the infection. Every blood or bloodproducts prior to its transfusion should be screened. In view of the asymptomatic nature of the infection in the most infected individual as reported by the literature reviewed, more studies need to be carried out in order to identify such carriers within the population.

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