



Serological evidence of Hepatitis C virus antibodies among students attending University of Maiduguri medical centre, Borno state, Nigeria

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Abstract

Hepatitis C virus is one of the major causes of viral hepatitis which considered as a major public health problem worldwide. This study was aimed to determine the prevalence of hepatitis C (HCV) antibody among students attending University of Maiduguri Medical Centre using HCV rapid screen test (*EGENS* Diagnostic Test, Manufactured by Nantong Egens Biotechnology Co., Ltd). Out of hundred (100) serum samples tested in this study, only 1(1.0%) was found positive. Also socio-demographic variables such as age, sex and history of blood transfusion were considered in this study, although, only history of blood transfusion was found to be the chief risk factor of acquiring HCV infection (X-squared = 11.9989, df = 1, p-value = 0.0005323). Therefore, screen blood and blood product was highly recommended in this study, since had been implicated as a chief means of HCV transmission.

Keywords: Hepatitis C virus, Diagnostic Test, blood and blood product.

Introduction

Hepatitis C virus is an RNA virus belongs to Flaviviridae family and having humans and chimpanzees as the only species vulnerable to its infection (Polyak, 2006; Pennap *et al.*, 2010). It is a viral infection of the liver and is the most common blood-borne (direct contact with human blood) infection. Hepatitis C virus like hepatitis B virus has been implicated in acute and persistent infections, as well as chronic liver diseases that may progress to cirrhosis and hepatocellular carcinoma (HCC) (Sule *et al.*, 2009). Commonly, 55% to 85% of the people with acute hepatitis do not get rid of the virus within 6 months and therefore, progress to chronic (long term) hepatitis C. About 70% of the chronically- infected persons will develop chronic liver diseases and 1% to 5% of them may die from the diseases (Sule *et al.*,

2009). The major causes of HCV infection worldwide are use of unscreened blood transfusions and re-use of needles and syringes that have not been adequately sterilized. The Schiff, (2002) and Ugbebor *et al.* (2011) reported that about 3% of the world populations (200 million people) have so far been infected with the Hepatitis C virus. Almost 50% of all the cases have become chronic carriers and are at risk of liver cirrhosis and liver cancer (WHO, 2000).The major causes of HCV infection worldwide are the use of unscreened blood transfusions, and re-use of needles and syringes that have not been adequately sterilized. The world health organization (WHO) estimates that about 3% of the world populations (200 million people) have so far been infected with the hepatitis C virus (Schiff, 2002; Ugbebor *et al.*, 2011).

Nigeria is an endemic area of viral hepatitis, and studies carried out by various researchers had shown that HCV infections are highly endemics among Nigerians. Isa *et al.* (2014) analyzed the results of Anti-HCV screening among patients attending Sokoto Specialist Hospital, with a view to establishing the prevalence rate in this State. Three hundred (300) serum samples were screened for Anti-HCV. The seropositivity rate among patients tested was found to be 2.7%. According to a recent study by Isa *et al.* (2015), Anti-HCV prevalence of 10% was found among children attending University of Maiduguri Teaching Hospital. The prevalence of HCV was reported by Muktar *et al.* (2005) as 5.2% in Zaria, north western Nigeria. Pennapet *et al.* (2010) also reported that the prevalence of Anti- HCV in Keffi, Nassarawa State of north central, Nigeria was 13.3%. Thus, the aimed of this study was to prevalence of HCV among student attending University of Maiduguri Medical Centre, Borno State, Nigeria.

Materials and Methods

Study area

The study was carried out in Borno State, situated in the North-Eastern part of Nigeria which lies in latitude 10°N and 13°E. The state occupies the greater part of the Chad Basin in the North- Eastern part of the country and shares international borders with the Republic of Niger to the North, Chad to Northeast, and Cameroun to the East. Most important to the country is the state's strategic location as a gate way to East and Central Africa. Internally, the state share borders with the neighboring states of Adamawa to the South, Yobe to the West and Kano to the Northwest and Gombe to the Southwest. The state has an area of 69,435 square kilometers, about 7.69% of the total land area of the country. Based on the 2006 census figure, it has the population density of approximately 60 inhabitants per square kilometer (NPC, 2006).

The University's Medical Centre established to cater for staffs and students' medical needs is situated in the school's premises, around the 'Academic Area' opposite Chemistry Department, adjacent left to El-Kanemi Hall and right to Faculty of Arts. The Medical Centre popularly called the University's Clinic provides medical care for staffs and students that are medically ill.

Questionnaire

Questionnaire used in this study obtained information about the student's sex, age, and history of blood transfusion which were considered as risk factors for acquiring HCV infection.

Collection of sample

About 2ml of blood sample was aseptically collected by vein puncture from each student and transferred into EDTA bottles. The blood samples were left to cloth after which plasma samples were separated from the serum by centrifuging at 4000rpm for 10minutes. Plasma was then separated from the serum and stored at room temperature in labelled bottles until assay.

Determination of Hepatitis C Virus

Anti-HCV antibodies were determined in plasma/serum using HCV rapid screen test (*EGENS* One Step Rapid Diagnostic Test, Manufactured by Nantong Egens Biotechnology Co., Ltd).

One Step ANTI-HCV Rapid Screen Test is a lateral flow, immunochromatographic screening test, which consisting of two purified recombinant antigens of HCV were used in test band as capture materials and gold conjugates. If the antibody of Anti-HCV was present in the samples in concentration above the labelled, a complex will be formed. This complex is then captured by antigen immobilized in the test zone of the membrane, producing a visible pink-rose color band on the membrane. The colour intensity depend on the concentration of the anti-HCV present in the sample.

Results

In this study, 100 serum samples were tested for the presence HCV antibodies; only one (1) was found positive giving HCV prevalence of 1.0%. Table 1 shows the seroprevalence of HCV antibodies in relation to the sex of the sample population. The study group comprises of 61 males and 39 females. One (1.6%) out of the 61 males was seropositive for HCV antibodies while none of the 39 females was found positive for HCV antibodies (Table 1).

Table 1: Distribution of HCV among students attending University’s Medical Centre based on Sex

Sex	Total	Positive	Positive (%)
Male	61.0	1.0	1.6
Female	39.0	0.0	0.0
Total	100	1.0	1.0

(X-squared = 0.0514, df = 1, p-value = 0.8207)

Table 2 shows the seroprevalence of HCV antibodies in relation to age of the subjects. The age groups were: 17-20 years, 21-24 years, 25-28 years, 29-32 years and >32 years. Among age group of 25-28 years, a total of 22 student samples were tested out of which one (1)

tested positive, thus, giving the highest and only prevalence of 4.5%. Age groups 17-20, 21-24, 29-32, and >32 showed zero seroprevalence to HCV antibodies (Table 2).

Table 2: Distribution of HCV among students attending University Medical Centre based on age

Age	Total	Positive	Positive (%)
17-20	15.0	0.0	0.0
21-24	46.0	0.0	0.0
25-28	22.0	1.0	4.5
29-32	11.0	0.0	0.0
>32	6.0	0.0	0.0
Total	100	1.0	1.0

(X-squared = 3.3079, df = 3, p-value = 0.3465)

The distribution of HCV antibodies in relation to the history of blood transfusion of the subjects, showed that, out of hundred students tested, only one student have history of blood transfusion which latter tested

and found positive for HCV antibodies, giving a seroprevalence of 100%, while those student that have no history of blood transfusion were negative and showed zero seroprevalence to the virus (Table 3).

Table 3: Distribution of HCV among students attending University Medical Centre based on History of blood transfusion

History of Blood Transfusion	Total	Positive	Positive (%)
Yes	1.0	1.0	100.0
No	99.0	0.0	0.0
Total	100	1.0	1.0

(X-squared = 11.9989, df = 1, p-value = 0.0005323)

Discussion

Hepatitis C virus is an important cause of morbidity and mortality. Detection of antibodies to various hepatitis C viral antigens indicates infection with the virus and in most cases portrays a chronic infection (Mc Lean *et al.*, 1997). The course of the chronic hepatitis can be prolonged and insidious and infected persons may not develop symptoms for many years after onset of chronic infection (Mc Lean *et al.*, 1997). In this study, one hundred serum samples tested from students attending the University’s Medical Centre

who’s agreed to participate in this study. Out of which 61 (61%) were males and 39(39%) were females. The prevalence of HCV antibodies among the students was 1%. This rate (1%) was lower than the 3% worldwide seroprevalence reported by World Health Organisation (WHO) in 1999 (WHO, 1999). It is also lower than the prevalence of 6.0% and 10.0% among patients attending State Specialist Hospital Maiduguri and University of Maiduguri Teaching Hospital (Isa *et al.*, 2014; Isa *et al.*, 2015). The 1% seroprevalence obtained in this study was also lower than the 8% reported amongst blood donors in Ibadan

Southwestern, Nigeria (Okonko *et al.*, 2009). However, the 1% seroprevalence reported for this study is slightly lower 2.7% seroprevalence reported for patients attending Sokoto specialist hospital (Isa *et al.*, 2014). However, the result of this study was higher than 0.4% observed for blood donors in Kano State, Nigeria (Imoru *et al.*, 2003).

In this study, students between the aged of 25-28 years (4.5%) had the highest prevalence for HCV antibody. This is contrary to the finding of Ejele *et al.* (2006), Okonko *et al.* (2009) and Ayolabi *et al.*, (2006) who reported highest prevalence of HCV antibodies were found among age group of 30-39 years, because, this group are sexually active. But agree with the findings of Isa *et al.* (2014) who reported highest prevalence (3.8%) for age group 18-49 years of which 25-28 years of this study is a subset. However, there is no statistical association (p-value >0.05) between age of the students and prevalence of HCV antibodies in the studied population.

In line with Inyama *et al.* (2005), males had higher (1.6%) prevalence of HCV antibody than their counterpart's females (0.0%). This might be due to the higher number of males participated in this study. This observation is contrary to of Isa *et al.* (2014), who reported that female (7.5%) had higher prevalence of HCV antibodies than male (4.3%). Similarly, Ejele *et al.* (2006) also reported that females had higher prevalence of HCV antibodies than males in Niger Delta of Nigeria. However, this study agrees with Mustapha *et al.* (2007) and Isa *et al.* (2014) that males had higher prevalence to HCV antibodies than females. However, there is no statistical association ($P > 0.05$) between gender of the students and prevalence of HCV antibodies in the studied population.

This study observed that the student tested with history of blood transfusion was found positive 1(100%) to HCV antibodies and it was statistically significant. This result agrees with the findings of Isa *et al.* (Isa *et al.*, 2014) who reported that patients with history of blood transfusion had higher prevalence than patients with no history of blood transfusion. Therefore, blood transfusion remains as a chief risk factor for contracting HCV infection.

Conclusion

The result of this study pinpointed the serological evidence of HCV antibodies among student attending University of Maiduguri Medical Centre. Out of hundred (100) serum samples tested in this study, only 1(1.0%) was found positive. Also socio-

demographic variables such as age, sex and history of blood transfusion were considered in this study, although, only history of blood transfusion was found to be the chief risk factor of acquiring HCV infection (X-squared = 11.9989, df = 1, p-value = 0.0005323). Therefore, screen blood and blood product was highly recommended in this study, since had been implicated as a chief means of HCV transmission.

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