



Original Article

Prevalence of Hepatitis C Virus among Patients Attending State Specialist Hospital Maiduguri, Nigeria

M.A. Isa*, H.S. Bello, H.K. Mangga and A. Mustapha

Department of Microbiology University of Maiduguri, P.M.B. 1069, Borno State, Nigeria

ARTICLE INFO

Corresponding Author:

Mustafa Albaji Isa
mustafaalhajjiisa@gmail.com

How to cite this article:

Isa, M.A., H.S. Bello, H.K. Mangga and A. Mustapha. 2014. Prevalence of Hepatitis C Virus among Patients Attending State Specialist Hospital Maiduguri, Nigeria. *The Journal of Applied Sciences Research*. 1(4): 274-278.

Article History:

Received: 20 November 2014
Revised: 22 December 2014
Accepted: 24 December 2014

ABSTRACT

Hepatitis C virus is among the most common cause 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 patients attending State Specialist Hospital Maiduguri using test kits (Manufactured by NEB CO., LTD), after the patients were advised on the need to know their status. Out of one hundred serum samples, only 6(6.0%) were positive. This includes, 2 (4.3%) were male while 4 (7.5%) were female. Distribution of HCV based age showed that those between 11- 20 years had higher prevalence of 13.6%, followed by >40 years 8.3%, 31- 40years 3.7% and 21- 30years have 2.7%. However, zero prevalence was recorded among <1- 10years group. Also HCV based on educational status showed that, only 4(5.5%) positive was found among people that attained formal education out of 73 samples tested while 2(7.4%) positive was found amongst people that attained non-formal education out of 27 samples tested. Therefore, there is urgent need to take public health measures to reduce disease burden and transmission, by routine screening of all for HCV infections and also government should provide health education campaigns to people on the dangers associated with HCV infection.

Keywords: Prevalence, HCV, Patients and Hospital.

Copyright © 2014, World Science and Research Publishing. All rights reserved.

INTRODUCTION

Hepatitis C virus is an RNA virus of the Flaviviridae family and appears to have humans and chimpanzees as the only species vulnerable to its infection (Polvak, 2006; Pennap *et al.*, 2010). Hepatitis C virus (HCV) was identified in 1989 (Choudhary *et al.*, 2003). It has a positive sense single-stranded RNA genome. The genome consist of a single open reading frame that is 9600 nucleotide bases long (Bonkovsky and Mehta, 2001). 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). Contaminated blood and blood products and body fluids are

common modes of transmission of HCV. Other risk factors include intravenous drug abuse, use of barber razor, dental procedures, tattooing ear piercing, acupuncture and high risk sexual behaviour (Havashmi *et al.*, 1995). HCV infections are also a major global health problem with an estimated 170 million people chronically infected and 3-4 million people get new infections each year. HCV infections lead to acute hepatitis in 20% cases, and chronic hepatitis in 50-80% cases of whom 10-20% develops liver cirrhosis and 1-5% develops liver cancer in 20-30 years (Ashraf *et al.*, 2010). 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).

Although some risk factors for acquiring HCV infections are present in 50% cases, no recognizable transmission factor could be identified in the remaining 50% (Memon and Memon, 2002; Ashraf *et al.*, 2010). Laboratory diagnosis of HCV infection is usually made on the basis of the detection of circulating antibodies. Serological tests for detecting antibodies to HCV are generally classified as screening tests or confirmatory tests. Hepatitis C (HCV) has remained recurring decimals in blood transfusion, vertical transmission, liver cirrhosis and hepatocellular carcinoma (HCC) (Chen *et al.*, 2009) approximately 350 million people are infected with HCV worldwide. Therefore, this study was aimed to determine the prevalence of hepatitis C (HCV) antibody among patients attending State Specialist Hospital Maiduguri, Borno State, Nigeria.

Study Area

The study was carried in Borno State, situated in the North-Eastern part of Nigeria 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 the North-East 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 north-west and Gombe to the South-West. The state has an area of 69,435 square kilometers, about 7.69% of the total land area of the country. Base on the 2006 census figure, the population density of approximately 60 inhabitants per square kilometer (NPC, 2006).

Questionnaire

Questionnaire was used in this study to obtain information about socio-demographic variable which considered as a risk factor of acquiring the HCV infection. The information includes sex, age, educational status, marital status, history of blood transfusion.

Collection of Samples

About 5ml of blood sample was aseptically collected by venipuncture from each subject and transfer into EDTA bottles. The blood samples were left to clot after which plasma samples were separated from the clot by centrifuging at 2000rpm for 10minutes. Plasma was then be separated from the clots and stored at room temperature in labeled bottles until assay.

Determination of Anti-HCV

Anti-HCV antibodies were determined in plasma using HCV rapid screen test (Manufactured by NEB CO., LTD) which is a third generation qualitative ELISA that uses recombinant proteins and synthesized peptides derived from core and structural regions of HCV to detect the presence of anti-HCV in plasma. The test was carried out and interpreted as recommended by the manufacturer.

Statistically Analysis

The chi-square test was employed to determine the relationships between gender, age, educational status, marital status, history of blood transfusion with HCV infection. P values of <0.05 were considered to be statistically significant.

RESULTS

The prevalence of Hepatitis C virus among patients attending State Specialist Hospital Maiduguri showed that out of one hundred serum samples, only 6(6.0%) were positive. This includes, 2 (4.3%) were male while 4 (7.5%) were female. The prevalence of HCV among female outweigh their counterpart male, although, no statistical significant different was observed between the prevalence of the virus and the gender ($\chi^2 = 0.0729$, $df = 1$, $p\text{-value} = 0.7872$) (Table 1).

Table 1: Distribution of HCV among patients attending State Specialist Hospital Maiduguri based on sex

Sex	Total (%)	HCV Positive	HCV Positive (%)
Male	47	2	4.3
Female	53	4	7.5
Total	100	8	6.0

($\chi^2 = 0.0729$, $df = 1$, $p\text{-value} = 0.7872$)

The distribution of HCV according to age showed that those between 11- 20 years had higher prevalence of 13.6%, followed by >40 years 8.3%, 31- 40years 3.7% and 21- 30years have 2.7%. However, zero prevalence was recorded among <1- 10years group, although, no statistical significant different was observed between the prevalence of the virus and the different age group ($\chi^2 = 3.4604$, $df = 4$, $p\text{-value} = 0.4839$) (Table 2).

Table 2: Distribution of HCV among patients attending State Specialist Hospital Maiduguri based on Age

Age	Total (%)	HCV Positive	HCV Positive (%)
<1 – 10	1 (1.0)	0	0.0
11 – 20	22 (22.0)	3	13.6
21 – 30	37 (37.0)	1	2.7
31 – 40	28 (28.0)	1	3.7
>40	12 (12.0)	1	8.3
Total	100 (100)	6	6.0

($\chi^2 = 3.4604$, $df = 4$, $p\text{-value} = 0.4839$)

The distribution of HCV based on educational status showed that, only 4(5.5%) positive was found among people that attained formal education out of 73 samples tested while 2(7.4%) positive were found among people that attained non-formal education, although, no statistical significant different was observed between the prevalence of the virus and the educational status of the studied population ($\chi^2 = 0.013$, $df = 1$, $p\text{-value} = 0.9094$) (Table 3).

Table 3: Distribution of HCV among patients attending State Specialist Hospital Maiduguri based on educational status

Educational Status	Total (%)	HCV Positive	HCV Positive (%)
Formal	73 (73.0)	4	5.5
Non-Formal	27 (27.0)	2	7.4
Total	100 (100)	6	6.0

($\chi^2 = 0.013$, $df = 1$, $p\text{-value} = 0.9094$)

The distribution of HCV based on marital status showed that married people have higher prevalence of 5(6.9%) than single with 1(3.6%). However, no statistical significant different

was observed between the prevalence of the virus and marital status of the studied population ($\chi^2 = 0.0285$, $df = 1$, p -value = 0.8659) (Table 4).

Table 4: Distribution of HCV among patients attending State Specialist Hospital Maiduguri based on marital status

Marital Status	Total (%)	HCV Positive	HCV Positive (%)
Married	72 (72.0)	5	6.9
Single	28 (28.0)	1	3.6
Total	100 (100)	6	6.0

($\chi^2 = 0.0285$, $df = 1$, p -value = 0.8659)

DISCUSSIONS

The seroprevalence of hepatitis C virus among patients attending State specialist hospital Maiduguri was analysed and the result was presented. The overall prevalence of 6.0% was observed in this study which is within the range of 5.8%-12.3% prevalence reported by Halim and Ajayi (2000). It is however, greater than 3.0% reported by Ejele *et al.*, (2006) in Niger Delta. The prevalence of HCV infection in our study was found to be higher when compared to reports from South East Asia (2.15%), America (1.17%), Europe (1.03%), Eastern Mediterranean (4.6%), Western Pacific (3.9%), (WHO, 2007) and Egypt (20%) and less than 8.4% seropositivity documented for blood donors in Lagos (Ayolabi *et al.*, 2006). The figure 6.0% is much lower when compared with studies from Enugu and Kaduna with 14.9% (Ebie and Pela, 2006), 11.9% (Strickland, 2002) respectively. The prevalence of HCV infection in our study was found to be higher when compared to reports from and Egypt (20%) (Frank *et al.*, 2002).

In this study, patients aged between 11 – 20 years (13.6%) had the highest HCV antibody. This was contrary to observations of Sule *et al.*, (2009) who reported that, high prevalence was found from patients aged 50 years and above. It also, disagree with the finding of Ejele *et al.*, (2006) and Ayolabi *et al.*, (2006) who reported highest prevalence of HCV antibodies in the age group 30 –39 years, the supposedly sexually active group. There was however, no statistical association ($\chi^2 = 3.4604$, $df = 4$, p -value = 0.4839) between age of the patients and prevalence rate of HCV antibodies (Table 2).

The distribution of HCV according to sex found that female had higher prevalence of 7.5% when compared with male (4.3%). This observation agrees with Sule *et al.*, (2009) who reported that female (4.6%) had higher prevalence of HCV antibodies than male (2.3%). But in contrary with finding of Inyama *et al.*, (2005) who reported that male had higher prevalence than female. However, it similar with the observation of Ejele *et al.*, (2006) that female had the higher HCV antibody prevalence than the males in Niger Delta, Nigeria. Statistical analysis however, showed no significant difference ($\chi^2 = 0.0729$, $df = 1$, p -value = 0.7872) between the prevalence rate of the male and female individuals (Table 1). Inyama *et al.*, (2005) and Mustapha *et al.*, (2007) made similar observation between male and female genders in Nigeria population. Other variable observed in this study include, educational status and marital status were apparently not statistically associated with HCV antibody prevalence in this study correspond with those made by Sule *et al.*, (2009) in Kogi state, Nigeria and Tess *et al.*, (2000) in Northwestern Tanzania.

CONCLUSION

A total of 6.0% studied population were sero-positive for hepatitis C virus. Therefore, there is urgent need to take public health measures to reduce disease burden and transmission, by routine screening of all for HCV infections and also government should provide health education campaigns to people on the dangers associated with HCV infection.

REFERENCE

- Ashraf, H., H.N. Alam, C. Rothermundr, A. Brooks, P. Bardhan, L. Hossain, A.M. Salam, S.M. Hassan, C. Beglinger and N. Gyr. 2010. Prevalence and risk factors of hepatitis B and C virus infections in an impoverished urban community in Dhaka, Bangladesh. *BMC Infectious Diseases*. 10:208. <http://biomedcentral.com/1471-2334/10/208>.
- Ayolabi, C.I., A.M. Taiwo, S.A. Omilabu, O.A. Abebisi, and M.O. Fatoba. 2006. Seroprevalence of Hepatitis C virus among Blood Donors in Lagos, Nigeria. *African J. Biotechnol.* 5(20): 1944-1946.
- Bonkovsky, H.L., and S. Mehta. 2001. Hepatitis C. A review and updates. *J. Am Acad Dermatol.* 44:159-79.
- Chen, L., F. Liu, X. Fan, J. Gao, N. Chen, T. Wong, J. Wu, and S.W. Wen. 2009. Detection of hepatitis B surface antigen, hepatitis B core antigen and hepatitis B virus DNA in parotid tissues. *International Journal of Infectious Diseases*. 13: 20-23.
- Choudhary, I.A., S.A. Khan and A. Samiullah. 2005. Should we do hepatitis B and C screening on each patient before surgery. *Pak. J. Med. Sci.* 21:278-80.
- Ebie, J.C., and O.A. Pela. 2006. Some sociocultural aspects of the problem of drug abuse in Nieria. *Drug and Alc. Dep.* 8: 301-306.
- Ejele, O.A., C.A. Nwauche, and O. Erhabor. 2006. Seroprevalence of Hepatitis C Virus in Niger Delta of Nigeria. *The Nigerian Postgraduate Medical J.* 13(2): 103- 106.
- Frank, C., M.K. Mohamed, G.T. Strickland, D. Lavanchy, R.R. Arthur, L.S. Magder, T. El Khoby, Y. Abdel-Wahab, E.S. Aly Ohn, W. Anwar and I. Sallam. 2000. The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt. *Lancet.* 355:887-891.
- Halim, N.K.D., and I.O. Ajayi. 2000. Risk factors and Seroprevalence of Hepatitis C antibody in Blood Donors in Nigeria. *East African Medical J.* 77(8): 410-412.
- Hayashmi, J., Y. Kishiharar, K. Yamaji, E. Yoshimura, Y. Kawakami, and K. Akazawa. 1995. Transmission of hepatitis C virus by Health care workers in a rural area of Japan. *Am. Jm. Gastroenterol.* 90(5):794-799.
- Inyama, P.U., J.C. Uneke, I.G. Anyanwu, M.O. Njoku, J.H. Idoko, and A.J. Idoko. 2005. Prevalence of Antibodies to Hepatitis C virus among Nigerian patients with HIV infections. *Online J. Health and Allied Sciences.* 2:2.
- Memon, M.I., and M.A. Memon. 2002. Hepatitis C: an epidemiological review. *J. Viral Hepat.* 9:84-100.
- Mustapha, S.K., M.T. Bolori, N.A. Ajayi, H.A. Aggada, U.H. Pindiga, W. Gashau, and M.I.A. Khalil. 2007. Hepatocellular carcinoma in north- Eastern Nigeria: A prospective Clinical Study of 100 cases. *The Internet Journal of Gastroenterology.* 6(1).
- National Population Commission. 2006. Report of the final national census results. Abuja, Nigeria.
- Pennap, G.R., A. Yakubu, O. Oyige, and J. Forbi. 2010. Prevalence of hepatitis B and C virus infection among people of a local community in Keffi, Nigeria. *African Journal of Microbiology Research.* 4 (4): 274-278.
- Polyak, P. 2006. Innate intracellular defence against HIV and its modulation by HCV gene product. Postgraduate Course, Vienna, pp: 30-33.
- Schiff, E. 2002. Hepatitis Central, Current information on Hepatitis C and treatment for medical profession, Uni Miami, pp:1-2.
- Strickland, G.T. 2002. HCV in developing Countries. Postgrad. Doc. (Africa) 24: 18-20.
- Sule, W.F., L.E. Odama, A.L. Daniel., A.O. Faneye and I.O. Okonko. 2009. Prevalence of Anti- Hepatitis C Virus in patients attending Federal Medical Centre (FMC), Lokoja, Kogi State, Nigeria. *World Applied Sciences Journal.* 7(3): 371- 377.
- Tess, B.H., A. Levin, G. Brubaker, J. Shao, E.J. Drummond, J.H. Alter, and O.R.T. Brien. 2000. Seroprevalence of Hepatitis C Virus in the General population of Northwest Tanzania. *American J. Tropical Medicine and Hygiene.* 62(1): 138- 141.
- Ugbebor, O., M. Aigbirior, F. Osazuwa, E. Ehiga and O. Zabayo. 2011. The prevalence of hepatitis B and C viral infections among pregnant women. *North American Journal of Medical Sciences.* 3(5):238-41. doi: 10.4297/najms.2011.3238.
- World Health Organisation. 2007. Hepatitis C, estimated prevalence and number infected by world region. Available at <http://www.who.int/csr/disease/hepatitis>.