The Journal of Applied Sciences Research

Journal homepage: http://www.journals.wsrpublishing.com/index.php/tjasr

Online ISSN: 2383-2215

Original Article

Prevalence of Anti- Hepatitis C Virus Antibodies among Patients Attending Sokoto Specialist Hospital, Sokoto State, Nigeria

M.A. Isa[1,*], U.K. Muhammad[2], S.B. Manga[2] and H.K. Mangga[1]

[1] Departments of Microbiology, University of Maiduguri P. M. B. 1069 Borno State, Nigeria
[2] Department of Microbiology, Usmanu Danfodiyo University P. M. B. 2346 Sokoto, Nigeria

ARTICLE INFO

Corresponding Author:
M.A. Isa
Mustafaalhajiisa@gmail.com

How to cite this article:
Isa, M.A., U.K. Muhammad, S.B. Manga and H.K. Mangga. 2014. Prevalence of Anti- Hepatitis C Virus Antibodies among Patients Attending Sokoto Specialist Hospital, Sokoto State, Nigeria. *The Journal of Applied Sciences Research.* 1(4): 261-260.

Article History:
Received: 3 December 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 Sokoto Specialist Hospital, using Acon ® Laboratory Inc, test kits, after the patients were advised on the need to know their status. Of the 300 blood samples tested, 8 (2.7%) was positive for the presence of hepatitis C. Demographic variables (Occupation, Sex, Marital status and education) and risk factors (History of blood transfusion, history of sexual transmitted diseases, intravenous drug abuse and presence of tribal mark or tattoos) appeared not associated ($p > 0.05$) with the prevalence of HCV antibody. However, there is urgent need to take public health measures to reduce disease burden and transmission, by routine screening of all for HCV infections.

Keywords: HCV, prevalence, infection, risk factors.

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 (Polyak, 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 consists 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, 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 behavior (Hayashmi *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 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). Almost 50% of all the cases have become chronic carriers and are at risk of liver cirrhosis and liver cancer (WHO, 2000). This infection present with malaise, anorexia, abdominal pain and jaundice but some time there are no symptoms till the development of cirrhosis, portal hypertension, oesophageal varieces, ascities, encephalopathy or liver malignancy (Muhammad *et al.,* 2007; Russel *et al.,* 2004; Cuschieri *et al.,* 2002). HCV infection remains a worldwide public health concern (Simonsen *et al.,* 1999; Wang *et al.,* 2002). The prevalence of HCV infection varies throughout the world with significant regional and ethnic differences. The highest number reported from Egypt following parenteral antischistosomal therapy with a prevalence of anti-HCV of 6-28% (mean 22%) depending on the regions (Frank *et al.,* 2000). 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. The most widely used screening tests are ELISAs (Khan *et al.*, 2011).

There are several studies on the prevalence of hepatitis C in the general population of Nigerians. A study published in 2010 reported 13.3% prevalence among people of a local community in Keffi, Nasarawa, Nigeria (Pennap *et al.,* 2010). Similarly, the prevalence of 3.0% reported by Ejele *et al.,* (2006) in Niger Delta, Nigeria and 8.4% seropositivity documented for blood donors in Lagos (Ayolabi *et al.,* 2006), and 3.6% prevalence reported by Ugbebor *et al.,* (2011) among antenatal patients attending the University of Benin Teaching Hospital, Nigeria. However, there is also lack of information on the prevalence of HCV infection among the general population of Sokoto State. Therefore, the objective of this research is to determine the prevalence of hepatitis C virus among patients attending Sokoto Specialist Hospital, Sokoto state, Nigeria.

MATERIALS AND METHODS

Study Area

The study was carried out in Sokoto metropolis, Sokoto state, Nigeria. It was located between longitudes 4° to 6° 40' north. It share border with Niger republic toward north, Zamfara state to east and Kebbi state to the south and west. It has population of 3,702,676 (National Population Commission, 2006). Sokoto State has a land area of about 28,232.37 km^2 (Sokoto State Government, 2009) with a mean annual rainfall ranging between 500mm to 1, 300mm. The mean annual temperature is about 28.3°C; the maximum daytime temperatures are under 40°C for most months of the year. The warmest months are usually between February and April, when daytime temperatures can exceed 45°C (Ikuomola, 2010). There are two major ethnic groups namely, Hausa and Fulani. Also, there are Zabarmawa as minority in the border of the local government areas.

Study Population

The study was a hospital based survey conducted on June/July 2012. It consists of 300 patients whom attended Sokoto state specialist hospital, during the period of the study, after

they were advised on the need to know their status. The populations include patients with no history of hepatitis or prior treatments against hepatitis virus infection, attending Sokoto state specialist hospital were screened for the study.

Ethical Approval

Ethical approval for this study was obtained from the Sokoto specialist hospital ethical committee.

Questionnaire

Questionnaires were used in this study to collect data from each patient. All the patients who fulfilled the inclusion criteria were interviewed in detail and the data was recorded on a prescribed questionnaire. The questions asked include sex, marital status, occupation, blood transfusion, tribal mark/tattoos, intravenous drug uses and education.

Collection of Samples

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

DETECTION OF ANTI – HCV

The hepatitis C virus antibody was detected using Acon ®Laboratory Inc, 4108 Sorrento Valley Boulevard, San Diego, CA 92121, USA.

This is a one step qualitative, membrane based immunoassay for the detection of antibody to HCV in serum or plasma. The membrane is coated with recombinant HCV antigen on the test line region of the strip. During testing, the serum or plasma specimen reacts with the protein A coated particles. The mixture migrates upward on the membrane chromatographically by capillary action to react with recombinant HCV antigen on the membrane and generate colored lines. Presence of this colored line will always appear at the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

Data Analysis

The data was subjected to statistical analysis (the χ^2-test, with the level of significance set at $p < 0.05$) using statistical package (R version 2.13.1) to determine any significant relationship between infection rate, age and gender.

The prevalence of the viral infection (HCV) was determined from the proportion of seropositive individuals in the total population under consideration and expressed as a percentage. The Pearson chi-square test was used to determine the relationships between the demographic data and HCV infection and P value < 0.05 was considered significant at 95% confidence interval.

RESULT

The overall, 8 (2.7%) patients tested positive to HCV antibodies; 7 (3.8%) of which were those between 18 – 49 and 1 (2.1%) were above 50 aged. None, of the patients tested positive for HCV antibodies were fall within range of <1 – 18 aged.

The results of the demographical variables, risk factors and seropositivity for Anti HCV antibodies are shown in Table 1. None of the four demographic variables (Occupation, Sex, Marital status and education) and four risk factors (History of blood transfusion, history of sexual transmitted diseases, intravenous drug abuse and presence of tribal mark or tattoos)

analysed showed statistical association with HCV antibody prevalence (P > 0.05).

Table 1: Risk factors and demographic variables for Anti HCV antibodies among patients attending Sokoto Specialist Hospital

Risk factors and Demographic factors	Total Samples	Total Samples (%)	HCV Positives	HCV Positives (%)	*P – value*
Age					
<1 – 17	69	23	11	15.9	1.4e-06
18 - 49	183	61	7	3.8	
>50	48	16	1	2.1	
Occupation					
Civil Servants	24	8	2	8.3	0.06915
Student	48	16	0	0	
House Wives	112	37.3	1	0.9	
Business Men	116	38.7	5	4.3	
Sex					
Male	164	54.7	6	3.7	0.4173
Female	136	45.3	2	1.5	
Marital Status					
Married	113	37.7	1	0.9	0.263
Single	187	62.3	7	3.7	
Education					
Primary	41	13.7	0	0	0.5499
Secondary	98	32.7	3	3.1	
Tertiary	15	5	1	6.7	
Non formal education	146	48.6	4	2.7	
Blood Transfusion					
Yes	24	8	3	12.5	0.06845
No	276	92	5	2.6	
Intravenous Drug Uses					
Yes	0	0	0	0	< 2.2e-16
No	300	100	42.0	14.0	
Tribal Mark/Tattoos					
Yes	9	3	0	0	0.5849
No	291	97	8	2.7	

DISCUSSIONS

Three hundred people among the patients attending Sokoto specialist hospital were volunteered to participate in this study. There were 136 females (45.3%) and 164 males (54.7%). They were categorized into those that were <1 - 17 years, 18 - 49 and those that were > 50 years old. Most of the patients were aged 18 - 49 years (61%). About 3.0% of the total population had tribal marks/tattoos and the proportion of patients having histories of blood transfusion was 8.0%. About 146 (45.6) of the patients do not undergone formal education while 187 (62.3%) were single. The seroprevalence of hepatitis C virus among patients attending Sokoto specialist hospital was analyzed and the result was presented in the Table below. The overall prevalence of 2.7% was observed in this study which is below the range of 5.8% - 12.3% prevalence reported by Halim and Ajayi (2000). It is however, slightly lower than 3.0% reported by Ejele *et al.,* (2006) in Niger Delta, Nigeria and less than 8.4% seropositivity documented for blood donors in Lagos (Ayolabi *et al.,* 2006), and 3.6% prevalence reported by Ugbebor *et al.,* (2011). The figure 2.7% is much lower when compared with studies from Enugu, Jos and Kaduna with 14.9% (Ebieand pela, 2006), 5.2% and 11.9% (Strickland, 2002) respectively. 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%) and Europe (1.03%), but lower when compared with Eastern Mediterranean (4.6%), Western Pacific (3.9%), (WHO, 2007) and Egypt (20%), (Frank *et al.,* 2002).

In this study, patients aged between 18 – 49 years (3.8%) 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. But agree 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. In this study age bracket 18 – 49 years of which age 30–39 years is a subset had the highest anti – HCV antibody seropositivity. There was however, no statistical association ($P > 0.05$) between age of the patients and prevalence rate of HCV antibodies.

The distribution of HCV according to marital status found that male had higher prevalence of 3.7% when compared with female (1.5%). This observation was contrary to Sule *et al.,* (2009) who reported that female (4.6%) had higher prevalence of HCV antibodies than male (2.3%). But in line with finding of Inyama *et al.,* (2005) who reported that male had higher prevalence than female. However, it coincided 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 ($P > 0.05$) between the prevalence rate of the male and female individuals. Inyama *et al.,* (2005) and Mustapha *et al.,* (2007) made similar observation between male and female genders in Nigeria population.

Blood transfusion is a chief risk factor for contracting HCV (Tess *et al.,* 2000). But this study observed that, of the 24 (8.0%) tested patients with history having blood transfusion, 3 (12.5%) tested positive to HCV antibodies. The prevalence of HCV antibodies was however, not statistically associated ($P >0.05$) with history of blood transfusion in the population study.
Other variable observed in this study include, Sex, occupation, education, intravenous drug abuse and tribal marks or tattoos 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 2.7% 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.

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. Dermato*l. 44:159-79.

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.

Cuschieri, S.A., R.J.C. Steele and A. Moosa. 2002. R editors. Essential Surgical practice, 4th ed. London: Arnold.

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. Mohammed, and G. Strickland. 2002. The role of parenteral antischistosomal therapy in the spread of Hepatitis C virus in Egypt. *Lancet*. 355: 887-891.

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*. 355:887-91.

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, 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.

Ikuomola, D.A. 2010. The socio-economic Implication of climatic change, desert encroachment and communal conflicts in northern Nigeria. Session: Climate change, conflict and livelihoods. Paper presented at the 250th Anniversary. Conference of the Royal Norwegian Society of Sciences and Letters on Climate Change and Security, Trondheim, Norway.

World Health Organization. 2000. Hepatitis B Fact sheet No 204. Available from: http://www.who.int/mediacentre/factsheets/fs204/en/print.html.

Inyama, P.U., J. C. Uneke, I.G. Anyanwu, M.O. Njoku, J.H. Idokoand, 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. Available at www. Ojhas.org/issue14/2005-2-2.htm.

Khan, U.N., I. Ali, U.N. Ahmad, A. Iqbal, U.L. Rehman, I. Munir, U.M. Rehman, S. Khan, S. Ali, L. Siddique and A.Z. Swati. 2011. Prevalence of active HCV infection among the blood donors of Khyber Pakhtunkwa and FATA region of Pakistan and evaluation of the screening tests for anti-HCV. *Virology Journal*. 8:154. http://www.virologyj.com/content/8/1/154.

Memon, M.I., and M.A. Memon. 2002. Hepatitis C: an epidemiological review. *J. Viral Hepat*. 9:84-100.

Muhammad, S.K., J. Muhammad, J. Sakhi, Z. Shoaib, S. Shahid and S.S. Ahmed. 2007. Prevalence of hepatitis 'B' and 'C' in Orthopaedics patients at Ayub Teaching Hospital Abbottabad. *J. Ayub Med. Coll Abbottabad*. 19(4).

Mustapha, S.K., M.T. Bolori, N.A. Ajayi, H.A. Aggada, U.H. Pindiga, W. Gashau, 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). https://ispub.com/IJGE/6/1/11995.

National Population Commission. 2006. Report of the final national census results. Abuja, Nigeria

Pennap, G.R., A. Yakubu, O. Oyige, 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.

Russel, R.C.G., N.S. Williams and C.J.K. Bulstrode. 2004. The liver. In: Bailey & Loves' Short Practice of Surgery, 24th ed. London: Chapman & Hall. 1076p.

Schiff, E. 2002. Hepatitis Central, Current information on Hepatitis C and treatment for medical profession, Uni Miami, pp: 1–2.

Simonsen, L., A. Kane, J. Lloyd, M. Zaffran and M. Kane. 1999. Unsafe injections in the developing world and transmission of bloodborne pathogens: a review. *Bull. World Health Organ*. 77: 789– 800.

Sokoto State Government of Nigeria. 2009. About Sokoto. Retrieved June 23, 2010.

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. Ehigha and O. Zabayo. 2011. The prevalence of hepatitis B and C viral infections among pregnant women. *North American Journal of Medical Sciences*. 3(5): 238-241.

Wang, S.C., T.T. Chang, J.W. Yao and P. Chou. 2002. Comparison of Hepatitis B virus and Hepatitis C virus prevalence and risk factors in a community-based study. *Am. J. Trop. Med. Hyg*. 66(4): 389–393.

World Health Organisation. 2007. Hepatitis C, estimated prevalence and number infected by world region. Available at http://www.who.int/csr/disease/hepatitis.