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SEROPREVALENCE OF HEPATITIS C SURFACE ANTIGENEMIA AMONG HIV-INFECTED INDIVIDUALS IN ABA, SOUTH EASTERN, NIGERIA

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ABSTRACT

Background: In order for health institutions in Nigeria to contribute towards the eradication of the spread of the deadly hepatitis C virus (HCV) infection, there is need for regular routine screening of all newly diagnosed human immunodeficiency virus (HIV) patients as is done for hepatitis B virus (HBV). This would enable care providers and policy makers appreciate the burden of an otherwise neglected disease condition and know where to focus as they distribute the limited resources.

Objective: To evaluate the seroprevalence of HCV among newly diagnosed HIV patients.

Design: A hospital based prospective study.

Setting: The Abia State University Teaching Hospital (ABSUTH), Aba in South Eastern Nigeria.

Subjects: Three hundred and six confirmed HIV positive adult patients who presented newly at the HIV treatment unit of the hospital between 1st March and 1st June 2016.

Results: The age of the patients ranged from 6-70 years with a mean of 36±10.2 years among the 306 newly diagnosed HIV patients within the studied period. The highest prevalence of HIV infection was seen between the age ranges of 30-39 years (38.20%) while the lowest prevalence was seen between the age ranges of 0-19 years (4.60%). Male prevalence of the studied population was 34.30%, giving a male to female ratio of 1:2. Age group with highest prevalence of HCV (37.5%) was 30-39 years while patients aged less than twenty (<20) or greater than seventy (≥70) had no HCV infection. Prevalence of hepatitis C infection among the HIV patients was 7.8% and was higher among females 13 (4.20%) than males 11 (3.60%) with no significant relationship between them (P>0.05). Prevalence of HCV among the patients with a CD4 count greater than 350 was 33.30%.

Conclusion: The study showed that HCV infection is relatively common in HIV – infected individuals. It is recommended that routine screening for HCV alongside HBV should be done for all HIV seropositive individuals even in resource limited settings.

INTRODUCTION

Hepatitis C virus (HCV) and human immune deficiency virus (HIV) co-infection constitute an increasing global health burden (1). They share similar transmission routes including sexual, blood-blood contact and injecting drug usage. It has been reported that the prevalence of HIV-HCV co-infection among intravenous drug users (IDUs) can surpass 90% in certain populations (2). An estimated four million persons are infected with the virus globally (1,3). It has its highest prevalence rate in Africa where it is the leading cause of liver cirrhosis and liver cell carcinoma (4).

Studies show that HIV infection adversely impacts on the natural history, diagnosis, progression, morbidity and mortality of HCV infection by accelerating progression to chronic liver disease due to drug-related hepatotoxicity and hepatic reactivation (5). Most patients are therefore likely to die from liver related diseases compared to those without HIV infection (6). It is known that liver toxicity from highly active antiretroviral therapy (HAART) exist but does not override the overall usefulness of HAART. With the present availability of HAART and consequent longevity of individuals infected with HIV, patients infected with HCV have a higher chance of death from liver-related causes. Current emphasis now is on reducing mortality, primarily from liver diseases among HIV patients. One of such strategy is screening of all HIV patients for HCV. The study by Crum-cianflone showed that 49% of HIV patients with abnormal liver function tests had well identified liver disease (7).

The risks associated with HIV transmission are similar to that of HCV. The diagnosis of chronic HCV infection in HIV infected patients is same as in HIV non- infected

(seronegative) patients. The AIDS virus depletion of gastrointestinal tract associated CD4 lymphocytes also make the gastrointestinal mucosa to become more permeable thereby causing microbial translocation and liberation of endotoxins such as lipopolysaccharide (LPS) which is pro-inflammatory and pro-fibrotic on the liver (8).

Studies suggest that HCV- DNA levels and reactivation rates are higher in HIV-infected patients than those with HCV alone and end stage liver disease is an important cause of death among patients with co-infection (9). Also HIV-infected patients, especially amongst Negro populations have been documented to have lower rates of spontaneous clearance of HCV with increasing mortality (10).

The World Health Organization (WHO) recommends that HAART should be commenced in HIV patients co-infected with HCV irrespective of value of CD4 count. This reduces liver-associated morbidities and mortalities in such patients. In Nigeria, free testing of HCV is not offered alongside free HIV testing and treatment in many centers. Consequently, many HIV patients whose CD4 counts are above 350 cells/ml and who may be positive to HCV are unrecognized and do not have early commencement of HAART with damaging consequences on their liver.

This study was carried out among HIV positive patients to determine the prevalence of HCV co-infection and to emphasize the need for inclusion of HAART in the treatment of all HIV patients co-infected with HCV in Aba. This was done with the knowledge that such patients are at a high risk of a rapid progression coupled with the development of liver cirrhosis and hepatocellular carcinoma. (11).

MATERIALS AND METHODS

A total of 306 confirmed HIV positive adult patients who presented newly at the HIV treatment unit of the Abia State University Teaching Hospital, Aba between 1st March and 1st June, 2016 were studied. Only those who gave informed written consent to participate in the study were recruited. Basic demographic data and information on previous history and risk associated with transmission of HIV and HCV infections were obtained.

About 3mls of venous blood was collected from each participant in a sterile plain tube. The samples were allowed to clot and retract after which serum was isolated by centrifugation at 250 revolutions per minute for about 5 minutes. The serum was separated using Pasteur's pipette and tested for anti-HCV antibodies using rapid test ELISA kits (Acon Laboratory, USA). Each test kit is a

lateral flow qualitative immune chromatographic assay and it followed the manufacturer's instructions. Specimen which could not be tested immediately were stored at 8^oc in the refrigerator until laboratory analysis the following day.

Data analysis was done using Statistical package for social sciences (SPSS, version 20). Comparison of means was done using the student t-test. The level of statistical significance was taken as $p < 0.05$.

RESULTS

A total of 306 confirmed HIV patients were screened for Hepatitis C virus infection. The age of the patients ranged from 6-70 years with a mean of 36 ± 10.2 years. The highest prevalence of HIV infection was seen between the age ranges of 30-39 years (38.20%) while the lowest prevalence was seen between the age ranges of 0-19 years (4.60%). (Table 1).

Table 1
Age and gender distribution of HIV patients

Age group (years)	Males	Females	Frequency	Valid percent (%)
< 20	5	8	14	4.60
20-29	26	47	72	23.50
30-39	36	75	117	38.20
40-49	22	58	74	24.20
50-59	12	9	23	7.50
60-69	4	3	5	1.60
≥70	0	1	1	0.30
Total	105	201	306	100%

There was progressive increase in the number of HIV patients with each increasing age group up to the 30-39 years age group and a gradual decline thereafter. Of the 306 HIV patients, 105 (34.30%) were males and 201

(65.70%) were females, giving a male to female ratio of 1:2. Male prevalence of HIV respondents was 34.30% while female prevalence of HIV respondents was 65.70%.

Table 2
Age and sex of HCV seropositivity among HIV patients

Age (years)	Males	Females	Total No tested	Total number positive (%)
< 20	5	8	13	0 (0)
20-29	26	47	73	3 (12.5)
30-39	36	75	111	9 (37.50)
40-49	22	58	80	7 (29.10)
50-59	12	9	21	4 (16.66)
60-69	4	3	7	1 (4.16)
≥70	0	1	1	0 (0)
Total	105	201	306	24 (7.80)

Age group with highest prevalence of HCV (37.5%) was 30-39 years while patients aged less than twenty (<20) or greater than seventy (≥70) had no HCV infection. The prevalence of Hepatitis infection among the HIV patients was 7.8%. The prevalence of HCV infection was higher among females 13 (4.20%) than males 11 (3.60%). However, there was no

significant relationship between them ($P>0.05$).

The prevalence of HCV among the subjects with a CD4 count greater than 350 ($CD4 > 350$) was 33.3%. This represents the percentage of HIV patients with HCV who may not be treated with HAART drugs since HCV screening is not routinely carried out on all patients (Table 3).

Table 3
Gender distribution of Hepatitis C infection among the respondents

Gender	Overall no screened	No positive for HCV (%)	No positive for HCV with CD4 > 350 (%)
Male	105	11 (3.60)	3 (0.98)
Female	201	13 (4.20)	5 (1.63)
Total	306	24 (7.8)	8 (2.61)

DISCUSSION

The relatively high prevalence of HCV in this study reiterates the importance of routine screening of HCV alongside Hepatitis B virus (HBV) in all newly diagnosed HIV patients in Nigeria. This aims at reducing morbidities and mortalities from liver diseases in such individuals through early commencement of appropriate therapy. The increased cancer risk among immuno-compromised persons with HIV/AIDS (PHA) is well documented in developed countries (12). With the increased access to antiretroviral therapy in resource limited settings, people living with HIV/AIDS

may continue to live longer (11). However, morbidity and mortality due to co-infection with other viruses are increasingly becoming important. Although co-infections with HCV/HBV among HIV positive patients is well documented in developing countries, the demographics and impact of these infections are not well defined in low resource countries like Nigeria. The need for up to date data on hepatitis co-infections to guide health policy on management of HIV co-infected patients is paramount.

The highest prevalence of HIV infection in the study was seen between the age ranges of 30-39 years. There was progressive increase in

the number of HIV patients with each increasing age group up to 30-39 years and a steady decline thereafter. This is similar to the results of other studies (13). It correlates with peak age of highest sexual activity in the society and supports the role of unprotected sexual intercourse in transmission of HIV.

The age distribution of HCV infection showed that individuals aged 30-39 years had the highest prevalence of HCV with an infection rate of 37.5 percent. Previous studies have also shown the highest prevalence of HCV infection among these age groups (14,6). These age groups contain active youths in the society therefore, the highest prevalence of HCV among the youths may be attributed to some social vices associated with them such as unprotected sexual activities with multiple partners, tattooing and intravenous drug use (1).

The overall prevalence of HCV among our study population was 7.8%. Muriuki et al (11) found a prevalence of 10% among HIV-1 infected individuals in Nairobi, Kenya. Similar high HCV prevalence among HIV infected patients were obtained in Tanzania (15). while a prevalence rate of 4.8% was obtained in a Nigerian cohort study (16). Similar HCV prevalent rates of 5.7% were found in the Malawian studies (17). However, a lower prevalence rate was seen in a similar study in Zimbabwe (0.8%) (18). The observed diverse prevalence rates across different countries may be associated with the diversity of patients from different population groups, sample size, test kit sensitivity and specificity. Also, these findings may be associated with incidence of intravenous drug abuse and needle sharing within the study population. The high prevalence rate of HCV in this study may therefore be explained by the urban status of our centre with its associated population dynamics.

The HCV seroprevalence rate among the females was higher (4.2%) than in males (3.60%). This difference is however not statistically significant (p -value >0.05). This is

similar to previous studies by Otegbayo et al, (19), who reported higher prevalence of HCV among females (16.6%) than males (3.4%). This may probably be due to higher sample size from females than males as in this study. However, the study by Ngwogu and Ngwogu (6), among voluntary blood donors in Aba reported higher prevalence of HCV infection in males (1.13%) than in females (0.37%), similar to the findings of Adekeye et al, (14) and Uneke et al, (20). This observation may be accounted for by the fact that men are more likely to have multiple sex partners and also practice unprotected sex due to the polygamous nature of their relationships.

Among the respondents that tested positive for HCV, eight had their CD4 count greater than 350. Screening for HCV alone does not fully reflect the epidemiology of the disease as it could indicate a carrier state, viral replication or chronic hepatitis (7). Our study did not differentiate carriers of HCV from those with active infection.

The prevalence of HCV among the respondents with a CD4 count greater than 350 ($CD4 > 350$) was 33.3% (Table 3). This represents the percentage of HIV patients with HCV who may not be treated with Highly Active Anti-Retroviral Therapy (HAART) drugs since HCV screening is not routinely carried out on all HIV patients in our centre. This underscores the need for all HIV patients co-infected with HCV to be treated with HAART irrespective of value of CD4 count.

The screening system in Nigeria needs to be strengthened and enforced. It is vital that the government comes up with some financial support to help facilitate full screening of all HIV-infected individuals and ensuring no patient is omitted. The laboratories need adequate staff with appropriate knowledge and skill.

CONCLUSION

In conclusion, this study showed that HCV infection is relatively common in HIV-infected individuals. It is recommended that routine screening for HCV alongside Hepatitis B Virus (HBV) should be done for all HIV positive individuals even in resource limited settings in order to reduce morbidities and mortalities from liver diseases amongst HIV positive patients.

REFERENCES

- Shittu, M.O., Adekola, S.A., Ajao, K., Adeniji, T.W. and Awe, C.O. Seroprevalence of Hepatitis B surface Antigenemia and Hepatitis C virus among intending Blood Donors at Mother and Child Hospital, Akure, Nigeria. *Int. J. Med. Med. Sci.* 2014; 47:1554-1557.
- Maier, I. and Wu, G. Hepatitis C and HIV co-infection: A review. *World Journal of Gastroenterology* 2002; 8:577-579.
- Ngwogu, K.O. and Ngwogu, A.C. Prevalence of Hepatitis B surface antigen sero-positivity and Hepatitis C virus among voluntary blood donors in Abia State University Teaching Hospital, Aba Nigeria. *International Journal of community Research* 2016; 5: 124-130.
- Olokoba, A.B., Salawu, F.K., Danburam, A., Desalu, O.O., Olokoba, L.B., Wahab, K.W. et al. Viral Hepatitis in voluntary blood donors in Yola, Nigeria. *European Journal of Scientific Research* 2009; 31:329-334.
- Benhamou, Y., Bochet, M. and Thibault, V. Safety and efficacy of adefovir dipivoxil in patients co-infected with HIV- 1 and Lamivudine-resistant HBV: an open-label pilot study. *Lancet.* 2001; 358: 718-723.
- Tan, Y., Wei, Q.H., Chen, I.J., Chan, P.C. and Lai, W.S. Molecular Epidemiology of HCV Monoinfection and HIV/HCV co infection in injection Drug Users in Liuzhou, Southern China. *PloS one.* 2008; 3:3608.
- Crum-Cianflone, N., Collins, G., Medina, S. and Asher, D. Prevalence and factors associated with liver test abnormalities among HIV- infected persons. *Clin. Gastroenterol. Hepatol.* 2010; 8:183 – 191.
- Megan, C., David, I. and Sharon, L.R. Human immunodeficiency virus infection and the liver. *World J. Hepatol.* 2012; 4:91-98.
- Colin, J.F., Cazals-Hatem, D., Lorient, M.A., Peignoux, M.M., Pham, B.N. and Auperin, A. Influence of Human Immunodeficiency Virus infection on chronic Hepatitis B in homosexual men. *Hepatology* 1999; 29:1306-1310.
- Thomas. D.L., Astemborski, J., Rai, R.M. and Anania, F.A. The natural history of Hepatitis C virus infection: Host, viral and environmental factors. *JAMA:* 2000; 284:450-456.
- Muriuki, B.M., Gicheru, M.M., Wachira, D., Nyamache, A.K. and Khamadi, S.A. Prevalence of hepatitis B and C viral co-infections among HIV-1 infected individuals in Nairobi, Kenya. *BMC Research Notes;* 2013; 6:363.
- Sule, A. HIV/AIDS, cancer and impact on surgical practice: Implication for the surgeon. *Niger. Med. J.* 2010; 51:101 –108.
- Onwuakor, C.E., Eze, V.C., Nwankwo I.U. and Iwu J.O. Sero-prevalence of hepatitis B surface antigen (HbsAg) amongst pregnant women attending antenatal clinic at Federal Medical Centre, Umuahia, Abia State, Nigeria. *American Journal of Public Health Research.* 2014; 2:255-259.
- Adekeye, A.M., Chukwuedo A.A, Zhakom, P.N. and Yakubu, R Prevalence of Hepatitis B and C among blood donors in Jos South LGA, Plateau State, Nigeria. *Asian Journal of Medical Sciences,* 2013; 5:101-104.
- Telatela, S.P., Mecky, I. M. and Munubhi, E.K. Seroprevalence of Hepatitis B and C viral co-infections among children infected with human immunodeficiency virus attending to paediatric HIV care and treatment centre at Muhimbili National Hospital in Dar-es-Salaam, Tanzania. *BMC Public Health,* 2007; 7:338
- Otegbayo, J.A., Taiwo, B.O., Akingbola, T.S., Adaibo, G.N., Adedapo, K.S. and Penugonda, S. Prevalence of Hepatitis B and C seropositivity in a Nigeria cohort of HIV infected patients. *Ann. Hepatol.* 2008; 7:152-156.
- Nyirenda, M., Beadsworth, M.B., Stephany, P., Hart C.A., Hart, IJ., Munthali C Prevalence

- of infection with hepatitis B and C virus and coinfection with HIV in medical in patients in Malawi. *J Infect.* 2008; 57:72-77
18. Kallestrup, P., Zinyama, R., Gomo, E., Dickmeiss, E., Platz, P. and Low prevalence of hepatitis C virus antibodies in HIV – endemic area of Zimbabwe support sexual transmission as a major route of HIV transmission in Africa. *AIDS* 2003, 17:1400–1402.
19. Otegbayo, J.A., Fashola, F.A. and Abja, A. Prevalence of hepatitis B surface antigen (HBsAg) risk factors for viral acquisition and trasaminase among blood donors in Ibadan, Nigeria. *Trop Gastroent*, 2003; 24: 196-197.
20. Uneke, C.J., Ogbu, O., Inyama P.V., Anyanwu, G.I., Njoku, M.O. and Idoko, J.H. Prevalence of hepatitis B surface antigen among blood donors and HIV – infected patients in Jos, Nigeria. *Memorias do Instituto Oswaldo Cruz Riode Janerio*, 2005; 100: 13–16