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Prevalence of Hepatitis C Virus (HCV) in Healthy Adults and Human Immunodeficiency Virus (HIV) Infected Persons in Abuja, Nigeria.

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Abstract:

The prevalence of HCV infection in Abuja, FCT, Nigeria was determined among healthy adults and HIV infected persons. A total of n=520 apparently healthy HIV negative persons and n=1,200 infected persons were tested for antibodies against HCV by rapid chromatographic immunoassay HCV kit (Acon, ACON laboratories Inc). The positive HCV antibodies samples were subjected to confirmatory test using third generation enzyme-linked immunosorbent assay (ELISA) kit (Hisen HCV card). Seven out of the (n=520) HIV negative persons tested positive for HCV antibodies and twenty four persons out of (n=1,200) HIV positive persons tested positive for HCV antibodies representing 1.4% and 2.3% positivity respectively in the two groups.

The prevalence of HCV among HIV infected persons and non HIV infected persons were statistically significant ($P>0.01$). Therefore, there is the need to fully integrate HCV screening as a routine test in our hospitals/laboratories in the country.

Keywords: HIV; HCV; HIV/HCV co-infection; ELISA, FCT

Introduction:

Since the introduction of highly active antiretroviral treatment (HAART), non-AIDS defining conditions have become major causes of illness and death in HIV-infected patients. In particular, liver disease has emerged as a major cause of death in the HAART era [19], [20]. In HIV-infected patients, chronic liver conditions are mostly caused by hepatitis C virus (HCV) and hepatitis B virus (HBV) [21].

Hepatitis C virus (HCV) is another major agent causing morbidity especially in sub-saharan Africa, but the epidemiology of the infection has not been fully determined. HCV infection is a major health problem throughout the world. Collective estimates indicate over 170 million people are infected with HCV worldwide with up to 4 million new infections each year [24], [23]. The majority (75–85%) of HCV-infected individuals progress from acute to chronic hepatitis C [22]. HCV infection has been referred to as the 'silent epidemic' as the majority (75–80%) of infected individuals is asymptomatic or unaware of their infection and has not been tested for HCV [24]. HCV may be transmitted by percutaneous exposure to infected blood or blood products.

HIV and HCV are largely blood-borne and also sexually transmissible [4]. As a consequence of the common route of transmission, a significant proportion of HIV infected individuals are co-infected with HCV with prevalence ranging from 4-9% depending on the percentage of intravenous drug users in the population [4]. Co-infection of HIV/HCV complicates an already complex set of issues related to diagnosis, clinical disease progression, monitoring disease activity, treatment options and basic immunology [28]. Studies show that HIV/HCV co-infected persons demonstrate a less effective T-cell response to highly active antiretroviral therapy (HAART) and their clinical progression to AIDS is faster than those infected with HIV alone [13]. Studies in Nigeria on the prevalence rate of HCV shows 2.1% in the general population, 3.6-8.0% in blood donors, 5.1% in high risk population and 8.2% in HIV– infected population [9], [27], [1], [26]. In tune with this, different states in Nigeria, such as Lagos, Osun and plateau states have recorded anti HCV antibody prevalence rates of 8.4% [30], 9.2% [30] 5.7% [25] respectively among blood donors, pregnant women and HIV patients. However, [31] reported HCV virus antibody prevalence of as low as 0.4% (n= 2,288) among male blood donors in Kano state.

Natural history studies with HIV-HCV co-infection have also shown more rapid progression of liver disease, and end stage liver disease due to hepatitis C is now a leading cause of death in HIV-infected patients [12]. However in spite of this, very little information on viral hepatitis C virus and HIV co-infection in Abuja, FCT, Nigeria is available. Globally, more attention is being given to HCV-HIV co-infection as a result of its higher frequency of chronic diseases [12].

Therefore, the main objective of this study is to determine and compare the prevalence of HCV in both healthy persons (non HIV infection) and HIV positive persons in Abuja, FCT; Nigeria.

MATERIALS AND METHODS

Study Area:

This research work was conducted in the Federal Capital Territory (FCT) Abuja. Abuja is the developing Federal Capital City of Nigeria. It is lying between latitude 8.25° and 9.20° north of the equator and longitude 6.45° and 7.39° east of Greenwich Meridian with a landmass of about 8,000 square meters. It has boundary with Kaduna state on the North, Nassarawa State in the East and South East, Kogi State to South West and Niger State to the West. It is divided into six area councils; Abaji, Gwagwalada, Kuje, Municipal, Bwari and Kwali area councils. It was a purposely built capital city to replace Lagos, and it officially replaced Lagos in December 1991, after 15 years of planning and construction. It is also the political capital city of Nigeria [29]. The central zone of Nigeria are reported to have the highest prevalence of sexually transmitted diseases (STDs) particularly HIV-infection [5].

Study Population:

A total of one thousand two hundred (1,200) samples were collected from clinical cases of HIV/AIDS and five hundred and twenty (520) samples of non HIV negative cases were collected from the four (4) health facilities in Abuja, FCT. These are Wuse General Hospital, National Institute for Pharmaceutical Research and Development (NIPRD), Asokoro General Hospital and Gwagwalada Specialist Hospital. The selection of these sites was based on their recognition and designation in HIV/AIDS diagnosis and treatments in FCT, Abuja.

Sample Collection:

A total of one thousand seven hundred and twenty (1,720) samples were collected over period of three months from the months of August to October 2011 from four health facilities. The table of random numbers was used for subject assignment. The subjects were counselled and consent obtained voluntarily. For children below the age of 18years consent was obtained from their parents. Five millilitres of blood was carefully drawn from the veins of the subjects into a well labeled EDTA blood sample container for plasma samples according to the standard protocol. Plasma was used for the study.

Screening for HIV and HCV:

HIV screening was carried out using HIV rapid test kit, Uni-Gold HIV kit (Trinity Biotech, Bray, Ireland) and further screened HIV antibodies using Genie 11 HIV-1/HIV-2 (Bio-Rad, 3 Boulevard

Raymond Poincare 92430 Marnes LA Coquette- France). Those samples tested positive for HIV antibodies were tested for antibodies against HCV using rapid chromatographic immunoassay HCV kit ACON (Acon laboratories Inc). The positive HCV antibodies were further confirmed using third generation enzyme-linked immunosorbent assay (ELISA) kit, commercially available (Hisen HCV card) according to manufacturer's specifications.

Statistical Analysis:

The SPSS statistical Package was used to analyze the results obtained. A comparison of the means of the samples of HIV infected and HIV/HCV co-infected case was obtained using Students t-Test and Analysis of Variance (ANOVA) was done to determine the variation in occurrence of HIV/HCV co-infection obtained from each of the four sample sites.

Result:

Of the One thousand two hundred (1,200) samples screened for HCV among HIV positive samples, 28 (2.33%) were positive for Hepatitis C (HCV). Eighteen (1.5%) of which were males while ten (0.83%) were females. It can be seen that the highest number of HIV/HCV co-infection was obtained amongst individuals at the age bracket of 26-35 groups as shown in Figure 1.

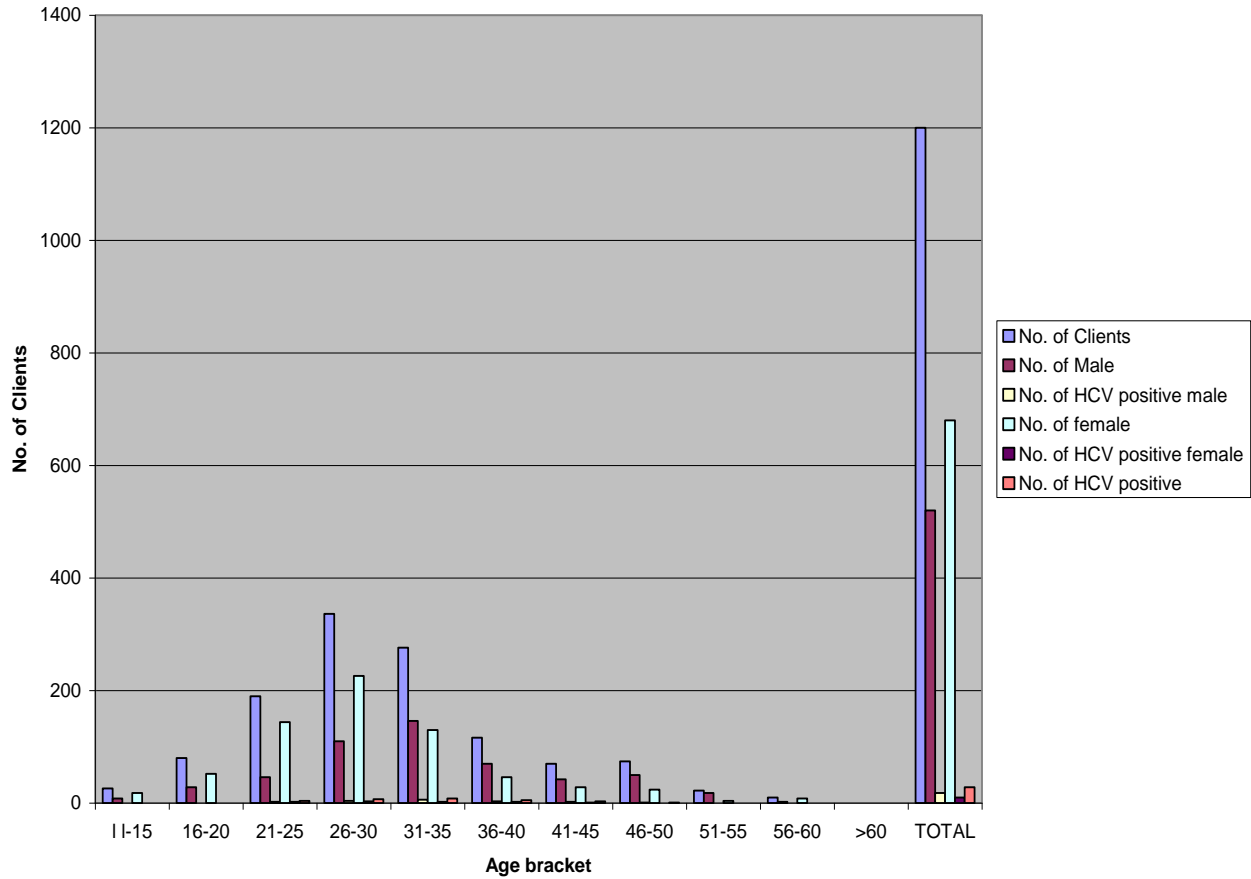


Fig.1: The prevalence of HCV among HIV infected patients in Abuja.

The results of five hundred and twenty (n=520) non HIV negative clients screened for HCV shows that seven (1.4%) were positive for HCV. Five (1.0%) were males and Two (0.4%) were females. It is seen that highest prevalence of HCV was obtained amongst the age bracket (41-45) as shown in Figure 2.

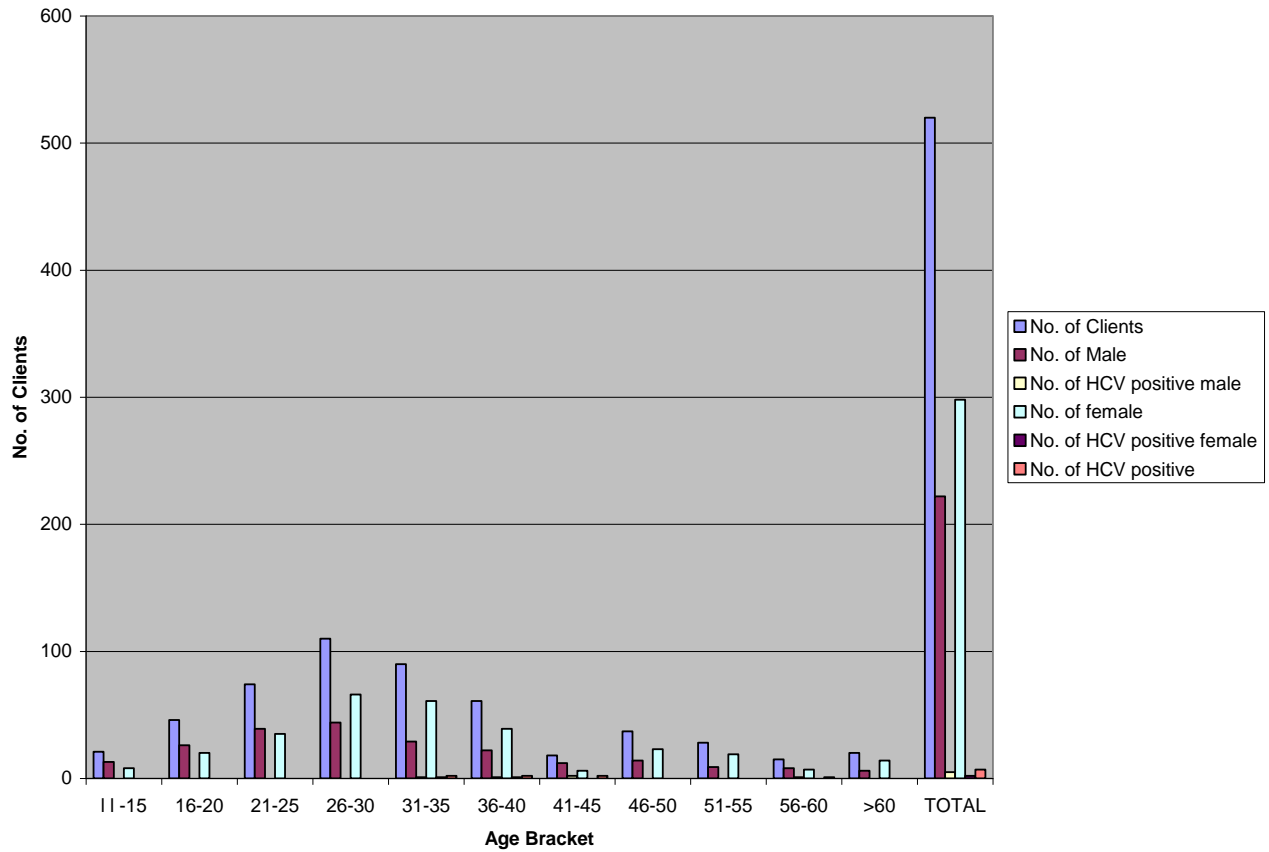


Fig.2: The prevalence of HCV among non-HIV infected patients in Abuja.

Statistical analyses shows that the prevalence of HIV/HCV co-infection among HIV patients was significant ($p > 0.01$) as observed in this study and Analysis of Variance (ANOVA) shows significant difference ($p < 0.01$) in the results obtained. Hence, the prevalence of co-infection is improperly distributed around the test population.

Discussions:

Chronic viral hepatitis is a leading cause of liver –related death among patients with HIV/AIDS worldwide [16]. Our findings showed that out of the one thousand two hundred (1,200) samples among HIV positive samples screened for HCV showed that 28 (2.33%) were positive for Hepatitis C (HCV). That observation compares well with the figure reported by [11] of 2-9% prevalence of HCV antibodies in HIV infected patients who stated that the co-infection rate depends on the risk groups. The percentage occurrence of the co-infection observed in this study also shares a concordant with the report of [17] in which it was reported that HCV infection is common among some HIV-infected persons but disagrees with the high prevalence of 33% that was reported. [9] reported a co-infection rate of 5.1% among the high-risk populations in Nigeria. The lower incidence of HCV observed in this study could be due to differences in socio-cultural as well as number of population size that was studied. It also could indicate a general decrease in the prevalence of HCV infection.

Sexually active age group is a factor that predisposes people to HIV infection and high rate of co-infection is expected in such groups. Age group with the highest co-infection was among the males of age bracket 31-35 years (mean 33 years) with 6 (33.33%) persons co-infected with HIV/HCV while that of females was at age bracket of 26-30 years (mean 28 years) had 3 (30.0%) cases. Generally, the age bracket with highest co-infection is 31-35 years (mean 33 years) with 8 (28.57%) cases. Data showed an increase in co-infection with age and peaked at the age bracket 31-35 after which a decrease followed and no co-infection was observed in people higher than 50 years. This increase in the rate of co-infection with age is consistent with the report of [18] and it may be due to differences in study population and to different routes of transmission of both viruses in Abuja, Nigeria compared to Europe and America.

Analysis of the sex-related sero-prevalence of HCV amongst the HIV infected patients and non HIV negative clients showed that the males were more infected than the females, though more of the HIV infected females reported to hospitals for medical attention than the males. The reason for higher frequency of HCV infection amongst the males was not immediately apparent and besides no statistically significant association was observed. However the prevalence of viral hepatitis is reported to be higher in male Nigerians than the females [6], probably due to the higher frequency of exposure to infected blood and blood products by the male folks as a result of occupation and social behavior [10].

The overall picture of co-infection endemicity in these studies is that of co-infection cases among people of age bracket 26-30 years, (mean 28 years) and age bracket 30-35 years, (mean age 33 years) which may probably be as result of distant iatrogenic transmission. Interestingly there were no cases of HIV/HCV co-infection among 106 subjects screened within the age range of 11-20 years. Therefore, the burden of chronic liver disease associated with HIV/HCV co-infection is not likely to increase in the coming decades in Abuja, FCT. The incidence of co-infection observed in the males (3.46%) is significantly higher ($p < 0.01$) than that observed in the females (1.47%). This could be attributable to cultural tendencies which empower the men to have more sexual partners as well as ignorance regarding mode of transmission.

Despite several limitations of this study; first, the risk factors for viral hepatitis acquisition were not available. As such we are unable to comment on this important aspect of the epidemiology of HIV, HCV and HCV/HIV co-infection. Second, plasma HCV-RNA was not quantified in patients who had anti-HCV, making it impossible to distinguish active HCV infection from spontaneously cleared infection. The result of this study still highlights the need for HCV screening in blood transfusion, HIV diagnosis as well as HIV/AIDS treatment centres. This is because patients who are co-infected with HCV and HIV are at an increased risk of disease progression as reported by [14]. Furthermore, prevalence of cirrhosis has been reported to be threefold higher in HIV/HCV co-infected patients than in patients infected with HCV alone [3], [8]. It was suggested [7], that there is need to address the treatment of HCV infection among HIV infected individuals because patients with HCV infection alone would respond to monotherapy with interferon- α while those who are co-infected with HCV and HIV are reported to have poor rate of response to the same monotherapy.

Conclusion

This study has shown that some HIV positive patients in FCT, Abuja are co-infected with HCV. The public health implication of this finding cannot be underscored, therefore, it has become important to work out plans for immediate intervention because of its public health significance. Routine screening of HIV positive patients for HCV co-infection prior to commencement of Highly Active Antiretroviral Therapy (HAART) is recommended for better health care delivery.

Recommendations:

1. Campaign need be intensified on the implication of HCV infection either alone or with HIV since they both share the same mode of transmission.
2. HCV screening should be included as part of routine test for diagnosis and treatment of HIV in the health facilities in Nigeria.
3. HCV tests should be free as in HIV test.
4. There should be availability of potent test kits for HIV and HCV in the various health facilities.
5. Protocols for HCV counseling and testing in the health facilities should be developed.

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