Full Length Research

SEROPREVALENCE OF HEPATITIS C VIRUS IN HIV POSITIVE PERSONS IN FEDERAL MEDICAL CENTRE, KEFFI, NASARAWA STATE, NIGERIA.

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ABSTRACT

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Co-infection with Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV) is becoming a major global problem, leading to increased morbidity and mortality in both developed and developing countries. The aim of this study was to determine the seroprevalence of HCV in HIV seropositive persons accessing healthcare at Federal Medical Centre, Keffi, Nasarawa State, Nigeria. A total of 808 blood samples of HIV infected persons were collected at the ART clinics from June, 2013 through February, 2015. Serological assay for HCV was done using rapid enzyme linked immunosorbent assay (ELISA) HCV kit ACON and ELISA positive samples were further confirmed with rapid ELISA HCV kit. Of the 808 HIV seropositive samples, 48 were positive for HCV with a prevalence of 5.9% with sex related prevalence of 17(2.1%) males and 31(3.8%) females. The highest prevalence of 26(3.22%) was observed at the age group 28–37 years, followed by 14(1.73%), 5(0.62%) and 1(0.12%) at the age group 18–27, 48–57 and >58 years respectively. The result of this study implies that HIV positive persons are likely to be co-infected with HCV. Hence there is need for its early diagnosis among HIV patients and should strongly be advocated to reduce the risk of further complications among these persons.

Keywords: HIV, HCV, ELISA, Seroprevalence, Co-infection, Mortality.

INTRODUCTION

The Hepatitis C virus (HCV) is a life threatening viral infection of the liver, transmitted primarily through infected blood and blood products. It is a single stranded RNA virus, belonging to the family of Flaviviridae (Kurbanov et al., 2003). Approximately 170 million people worldwide are chronically infected by the virus. Human immunodeficiency virus (HIV) is also a very important global public health problem, infecting about 33 million people worldwide (UNAIDS, 2008).

Co-infection with human immunodeficiency virus (HIV) and the Hepatitis C virus (HCV) is a growing public health concern. The transmission routes shared by both infections are in similar ways notably through sharing of needles to injection of drugs and possibly unprotected sexual activities. Most studies have shown that HIV infection leads to a more aggressive hepatitis C virus infection and a higher risk of liver damage, eventually leading to cause of death in HIV infected patients (Offor et al., 1992).
According to a review of age-specific seroprevalence studies carried out between 1990 and 2005, about 184 million people worldwide have anti-HCV antibodies. Also, the prevalence of HCV in the West African Sub-region was 2.8 million with Nigeria contributing to the number of data points in the region (Mohd et al., 2013). Although, HCV infection has been reported in the general Nigerian population, limited studies have reported HCV and HIV co-infection during this HAART era.

HCV infection is spontaneously cleared within six months. HCV clearance has been suggested to occur in individuals who have overt symptoms of hepatitis, who have non-African descent, and lack HIV infection (Thomas et al., 2000). In about 60 to 85% of persons, spontaneous resolution does not occur, chronic HCV infection is a heterogeneous condition, with individual manifestations and rates of progression (Hadziyannis and Vassilopoulos, 2001).

Patients infected with HIV may be co-infected with HCV because of the similar transmission routes of both etiologic agents. It is estimated that one-third of people living with HIV are co-infected with HCV worldwide (Bruno et al., 2002). The prevalence of HIV/HCV co-infection is high, with 13 time’s greater risk in HIV patients (Balogun et al., 2010). Evidence that HIV influences HCV disease progression through immune-suppression has been observed. The advent of effective prophylactic drugs highly active anti-retroviral therapy (HAART) has reduced HIV/AIDS related mortality but end-staged liver disease has become a leading cause of death in HIV infected individuals who do not clear HCV infection (Bica et al., 2001).

Prior to the advent of HIV/AIDS in Nigeria, there was lack of enforcement of regulation guiding blood transmission in many localities; this enhances the indiscriminate blood transfusion practice and dominance of commercial donors among blood donor. Parenteral exposure modes such as intravenous drug use (IVDU) or multiple transfusions have been consistently found to be the most important risk factors for co-infection (Tedaldi, 2003). Available data showed that the prevalence of hepatitis C virus among local commercial blood donor in Nigeria ranged from 12.3-14.0 % (Ajayi, 1992).

Nigeria belongs to the leading group of countries highly endemic for viral hepatitis infection, about 75% of the Nigerian population is likely to have been exposed to the virus at one time or the other in their life and 7% of these people might die as a result of its complication (Pilliero, 2002). HIV/AIDS among the general population has assumed a prevalence of 4.1% in 2010 (Bashorun et al., 2014). Although, HIV may be a chronic manageable disease for many individuals, but end stage liver disease is an increasing serious concern for people co-infected with HIV and hepatitis. The knowledge of this growing concern initiates the study to determine the seroprevalence of HCV in HIV seropositive persons in Keffi, Nasarawa State, Nigeria because of the associated risk of transmissible HCV infection which may accompany the transmission of HIV, to advocate for its early detection and to proffer immediate clinical managements.

MATERIALS AND METHODS

Materials

The test kits used for the test include ACON (ACON, laboratory INC. USA) and ORTHO HCV version 3.0 ELISA (Ortho-Clinical Diagnostics, Raritan, NJ). The major consumables include 5 mL EDTA vacutainer blood sample bottle, 21G vacutainer needle and tourniquet.

Study Area

The study area for this research work was Keffi, it is approximately 68km from Abuja, the Federal Capital Territory and 128km from Lafia, the Capital of Nasarawa state. Keffi is located between latitude 8° 5 N of the equator and longitude 7° 8 E and situated on an altitude of 850m above sea level (Akwa et al., 2007). It has land mass of 27,118 square kilometres and located in the Savannah belt of Nigeria. It has a climate typical of the tropical zone. The population of the state as at 2006 is put at 2 million people. The state is made up of about 300 ethnic, sub ethnic and cultural groups each with a distinct heritage; living in peace and social harmony with one another. The state is accessible through Benue State to the South and Kogi State to the West, the Federal Capital Territory (FCT), Abuja to the North West, Kaduna and Plateau to the North-East, and Taraba State to the South East (Henry, 2008).

Ethical Considerations

Ethical considerations and approval for the study was sort from the Health Research and Ethics Committee of Federal Medical Centre, Keffi, Nasarawa State in accordance with the code of ethics for biomedical research involving human subjects. The patients were enrolled after they were sufficiently counseled and
their written informed consents and participant information sheet obtained respectively. Relevant confidentiality was maintained throughout and after the study period.

**Study Design**

The research was a prospective study. The recruitment of the participants was non-randomized and they were consented to participate in the study. The Participants were enrolled into the study when found eligible for ART as per the national guidelines on ART and fulfillment of the following inclusion/exclusion criteria: aged 18 years and above; must have laboratory evidence of HIV seropositive result, were eligible to start ARV, not on ART prior to the study and absence of any serious chronic infection or disease. Participants were excluded if they were coming from outside the catchment area of the ART Hospital, were below 18 years of age, patients ineligible for starting ARVs and on ART prior to the study. The participants were screened for HCV antibodies using rapid enzyme linked immunosorbent assay (ELISA) system, the reactive patients were further confirmed using third generation ELISA.

**Study Population**

A total of eight hundred and eight (808) of adults living with HIV / AIDS consisting of both males and females adult of various ages 18-57years presenting at the ART clinics of Federal Medical Center, Keffi, Nasarawa state, who agreed to participate in the study were selected (Aminu et al., 2009).

**Sample Collection and Processing**

Five milliliters (5 mL) of venous blood was aseptically collected into sterile BD Vacutainer® (EDTA) tubes and allowed to clot, then centrifuged. The serum was collected and stored at -20°C until needed. The test and interpretation of results were done based on manufacturer’s instructions on the usage of kits.

**HCV Serological Screening**

The sera of seropositive HIV patients were screened for antibodies against Hepatitis C virus (HCV) by rapid enzyme linked immunosorbent assay (ELISA) HCV kit ACON (ACON laboratory INC.), and ELISA positive samples were further subjected to third generation rapid ELISA HCV kit ORTHO HCV ELISA (Ortho-Clinical Diagnostics, Raritan, NJ) according to the manufacturer’s instructions.

**Data and Statistical analysis**

Prevalence was recorded as simple percentages and presented in bar charts. All statistical analyses were performed using Statistical Product and Service Solution (SPSS) software (version 17.0, SPSS, Chicago, USA) and the level of significance was set at ( p = 0.05).

**RESULT AND DISCUSSION**

A total of 808 HIV patients aged 18-57 years were enrolled in this study, of which 317(39.2%) were males and 491 (60.8%) were females. The serum samples of the patients used in this hospital were confirmed seropositive HIV cases. Forty eight out of eight hundred and eight, (5.9%) had detectable antibodies to HCV; hence co-infected as shown in Figure 1. The seroprevalence of 5.9% for HCV antibody observed in this study was within range of 5.8 - 12.3% prevalence reported by Halim and Ajayi (2000), from Ibadan. However, Ejele et al (2006), reported lower than 3.0% (n = 366) in Niger Delta, and 8.4% (n = 167) seropositivity was reported by Ayolabi et al (2006), among blood donors in Lagos, Nigeria. These differences might not be connected with the fact that some of the studies were not from the same risk group. In relation to sex prevalence, the per centage occurrence of the infection observed in this study with females 31 (64.6%) had higher HCV antibody prevalence than males 17(35.4%) was not in agreement with the report of Inyama et al (2005) and Multimer et al (1994), which observed that the prevalence of viral hepatitis is higher in male Nigerians than the females. This expectation was 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. But, the observation was consistent with that of Ejele et al (2006), where female had higher HCV antibody prevalence than males in Niger Delta, Nigeria. There was no significant difference between the prevalence rates of the female and male individuals as noticed by the percentage difference of the prevalence. This simply depicts that hepatitis C virus has no host preference as both sexes are susceptible to it.

In this study, patients of age group 28 – 37 years had the highest HCV antibody prevalence 26 (3.2%). This was in agreement to observation of Ejele et al (2006), and Ayolabi et al (2006), who reported the highest prevalence of HCV antibodies in the age group 30 – 39 years, the supposedly sexually active group. The age group 58 years and above had lowest prevalence 1.
(0.12%) of HCV antibody seropositivity. The reason for this was not immediately apparent, but this was suggestive of the probability of transmission routes other than sexually activities as mode of acquisition of HCV among the seropositive patients. This was, however, not statistically significant (p=0.05) between age of the patients and prevalence of HCV antibodies. The observed prevalence of 5.9% co-infection of HCV in HIV infected patients in this study, was in agreement with 5.7% reported by Inyama et al (2005) from Jos, but lower than 8.2% reported by Agwale et al (2004), in northern Nigeria, and 11.1% in Keffi by Forbi et al (2007), and higher than 4.8% reported by Jesse et al (2008), in Ibadan. The factor responsible for these regional variations are unclear, although the reported co-infection rates of HCV in HIV patients have been variable worldwide depending on the geographic region’s risk factors (Dodig and Tavill, 2001; Tien, 2005) and these could be responsible for the decrease in the prevalence observed in this study. Madhava et al (2002), also reported a co-infection rate of 5.1% among the high-risk populations in Nigeria. The HCV co-infection among HIV-infected patients have been reported frequently from region to region which is in agreement with variations noticed in studies carried out in Nigeria. This co-infection is non-negligible, and patients co-infected with these two viruses should receive special care, as it is known that HCV infection causes increased morbidity and mortality in HIV-positive patients (Monga et al., 2001; Chen et al., 2009).

A number of studies have confirmed that age is a factor for disease susceptibility and progression (Verucci et al., 2004). The highest prevalence was expected in the age group 18-27 years, but prevalence of 5 (0.62%) was obtained. This is due to the fact that these age groups constitutes very active individuals in the society and through their social activities and lifestyles could be prone to infection, therefore, liver related diseases would be reduce to minimal level in decades to come in keffi, Nasarawa State, Nigeria. There was no statistical significance between age group with HCV antibodies (p = 0.05).

Most of the HIV infected patients enrolled in our study were young age between 18 and 40 years old who were sexually more active and thus have a higher risk of infection compared to the other age groups (UNAIDS, 1998). These findings could conform to previous
reports from elsewhere in Ethiopia which reported that HIV prevalence decreases significantly to increasing level of education as well as their socio economic status (Bradley et al., 2007). Sexually active age group is a factor that predisposes people to HIV infection and high rate of co-infection is expected in such groups. Contrary to observation of Inyama et al (2005) that females (3.8%) in this study had higher HCV antibody prevalence than the males (2.1%) was consistent with that of Ejele et al (2006), who observed that females had higher HCV antibody prevalence than males in Niger Delta, Nigeria. The potential explanation for more females at our health centre had high HCV is that woman present for care after positive HIV test on their sick children, death of their husband, or perhaps they are more sensitive to changes in their health and may be socially conditioned to seek and receive assistance for their sickness. This, however, does not translate that more women are infected with HIV in our population, as study in Nigeria actually found that more men were afflicted with HIV/AIDS (Ola et al., 2005).

CONCLUSION

The screening of these population revealed the prevalence of HCV antibodies in HIV infected individuals to be 5.9% and should be seen as high risk populations. This can probably be attributable to lack of adequate information about HCV and portrays the fact of in-adequate information about HCV by the subjects studied. This finding call for a proper enlightenment campaign on the scourge of this virus particularly in developing nations and equally advocate early screening of HCV antibodies for HIV patients because of the high prevalence recorded in this study.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

REFERENCES


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