Research Journal of Medical Sciences 2 (5): 217-219, 2008
ISSN: 1815-9346

Hepatitis C Virus and Human Immunodeficiency Virus Co-Infection in North-Eastern Nigeria

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Abstract: To determine Hepatitis C virus and Human immunodeficiency virus co-infection rate in North-Eastern Nigeria. Hospital-based cross-sectional study. HIV/AIDS clinic of the Federal Medical Centre, Yola. Nigeria. From December 2006 to December 2007. Two hundred consecutively recruited HIV/AIDS patients comprising 69 males and 131 females were screened for anti-HCV antibodies using ELISA. The biodata of the patients were obtained. Out of the 200 HIV/AIDS patients tested, nine were positive for anti-HCV antibodies giving an overall co-infection rate of 4.5%. Of the 69 males who had HIV/AIDS, 4 (5.8%) were positive for anti-HCV antibodies while 5 (3.8%) of the one hundred and thirty one females with HIV/AIDS were positive. Co-infection rate was highest in the 30-39 years age group (44.4%), while no case of co-infection was found in the 10-19, 50-59 and 60-69 years age groups. This study confirms a low co-infection rate of Hepatitis C virus infection in patients with HIV/AIDS. However, there is still a need to screen patients with HIV/AIDS for Hepatitis C virus infection.

Key words: Hepatitis C Virus, HIV/AIDS, anti-HCV, Co-infection

INTRODUCTION

Human immunodeficiency virus (HIV), the causative agent of Acquired immunodeficiency syndrome (AIDS) is found in pandemic proportions globally (Osmond and Dennis, 1994). HIV is a scourge, progressing and causing devastation to lives and the healthcare system worldwide (Carpenter *et al*., 2000) HIV accounted for 38.6 million infections worldwide at the end of 2005. As at 2003, there were about 5.8 million people infected with HIV in Nigeria, giving a national prevalence rate of 5.8% (FMH, 2004). At present, there are an estimated 170 million HCV carriers worldwide, most of who are thought to be in the developing countries (Maddava *et al*., 2002). HCV plays an important role in the causation of chronic liver disease (CLD) (Lesi *et al*., 2002) and has become the leading cause of liver cirrhosis and primary liver cell carcinoma (PLCC) in North America, Southern Europe and Japan (Colquhon, 1996; Cheng, 1995).

Human immunodeficiency virus and HCV have similar routes of transmission namely through blood and blood products, intravenous drug abuse, unsafe injections and sexual activity enabling co-infection with these viruses a common event (Braun, 2003). HCV is ten times more infectious than HIV on blood to blood contact and the probability of transmission from needle stick injuries after exposure to HCV contaminated blood is 2-8%, compared to only 0.3% after exposure to HIV contaminated blood (Eyster *et al*., 1993). Liver disease is now a leading cause of death among HIV and HCV co-infected patients. In a study of HCV and HIV co-infected patients, the risk of cirrhosis was 25% compared with 6.5% in HCV infection alone (Lauer and Walker, 2001).

Reports regarding HCV and HIV co-infection rate in Nigeria is sparse especially in the North-eastern region. We, therefore, investigated the co-infection pattern of HCV amongst HIV/AIDS patients in the North-eastern Nigeria.

MATERIALS AND METHODS

The serum samples of all double ELISA confirmed HIV infected patients referred to the HIV/AIDS clinic were additionally screened for HCV using rapid test ELISA kits (Acon Laboratories, USA) to detect antibodies to hepatitis C virus (anti-HCV).

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Their biodata was obtained. Verbal and written consent of the patients were obtained.

Analysis: The data obtained were analysed using the statistical package for social sciences (SPSS, version 10.0) statistical software.

RESULTS

At the conclusion of the study, 200 double ELISA confirmed HIV/AIDS patients were screened. Nine (4.5%) were anti-HCV antibody positive.

Age: The age of the patients studied ranged from 18-64 years with a mean of 35.4+/-8.7 years. There was a steady increase in the age groups of the patients, with a peak in the 4th decade (43.0%) and a decline towards the 7th decade (1.0%). Majority of the patients were in the age group 30-39 years (i.e., 43.0%).

Out of the nine patients who were anti-HCV antibody positive, 4 (5.8%) were males while 5 (3.8%) were females. Of the patients with co-infection of HIV and HCV, majority belonged to the age group 30-39years age group. None of the patients in the age groups 10-19, 50-59 and 60-69 years had co-infection of HIV and HCV.

Three out of the 52 patients (5.8%) in the age group 20-29 years were co-infected with HIV and HCV while 4 out of the 86 patients (4.7%) and 2 out of the 46 patients (4.3%) within the age groups 30-39 and 40-49 years respectively had co-infection (Table 1).

Sex: Out of the 200 patients screened, 131 patients (65.5%) were females while 69 patients (34.5%) were males. Out of the 69 males screened, 4 of them (5.8%) had co-infection of HCV and HIV while out of the 131 females screened, 5 of them (3.8%) had co-infection (Table 2).

Table 1: HIV and HCV coinfection rate among various age groups

Age groups (Years)	HIV positive (n) (%)		Dual HIV/HCV positive (%)
10-19	2	1	-
20-29	52	26	3 (33.3)
30-39	86	43	4 (44.4)
40-49	46	23	2 (22.2)
50-59	12	6	-
60-69	2	1	-
Total	200		9

Table 2: HIV and HCV coinfection rate according to gender

Sex	Total HIV positive (%)	Total HIV/HCV positive (%)
Male	69 (34.5)	4 (5.8)
Female	131(65.5)	5(3.8)
Total	200	9(4.5)

DISCUSSION

A review of the literature shows that patients with co-infection of HCV and HIV have been reported (Saravanan *et al*., 2007; Holland *et al*., 2000; Lodenyo *et al*., 2003; Muktar *et al*., 2006; Rai *et al*., 2007). There is evidence that HCV will contribute more to morbidity and mortality in HIV/AIDS patients because of increased use and accessibility to highly active antiretroviral therapy (HAART), since these patients will live longer. The introduction of HAART has led to a significant decrease in the morbidity and mortality in the HIV/AIDS patients. This allowed the expression of liver related complications associated with HCV chronic infections (Vallet-Pichard, 2004).

HCV antibody tests have a strong positive predictive value for exposure to the hepatitis C virus, but may miss patients who have not yet developed antibodies (seroconversion) or have an insufficient level of antibody to detect. Rarely, people infected with HCV never develop antibodies to the virus and therefore, never test positive using HCV antibody screening. Because of this possibility, RNA testing should also be considered (http://en.wikipedia.org/wiki/Hepatitis_C). Anti-HCV antibodies indicate exposure to the virus, but cannot determine if ongoing infection is present (http://en.wikipedia.org/wiki/Hepatitis_C).Furthermore,immunosuppression from HIV infection may impair antibody formation and false-negative HCV antibody tests have been reported in individuals co-infected with HIV (Chamot *et al*., 1990; Sorbi *et al*., 1996).

The reported co-infection rate of HCV in HIV patients have been variable world wide depending on the geographical region, risk groups and type of exposure involved (Saravanan *et al*., 2007).

An HCV and HIV co-infection rate of 4.5% was found in this study. This figure is higher than the 2.2% co-infection rate of HCV and HIV found in Southern India by Saravana *et al*. (2007). It is also higher than the 1.6% found among HIV infected adolescents in Washington, USA by Holland *et al*. (2000) and the 1.0% found by Lodenyo *et al*. (2003) in South Africa. The HCV and HIV co-infection rate of 4.5% found in this study is however lower than the 10.3% found in Zaria, North-Western Nigeria by Muktar *et al*. (2006) and the 17.2% found by Rai *et al*. (2007) in India.

The wide variations in HCV and HIV co-infection rate found by various researchers within and outside Nigeria might be due to differences in cultural practices, methodologies adopted and the test reagents used. It may also be related to the periods of time the studies were carried out. Additionally, whether or not the researchers test for HCV RNA and or anti-HCV antibodies may also

play a role. The studies carried out by Lodenyo *et al.* (2003), Holland *et al.* (2000) and Muktar *et al.* (2006) only assayed for anti-HCV antibodies as a marker of HCV infection whereas Rai *et al.* (2007) and Saravana *et al.* (2007) in addition assayed for HCV RNA. This may explain the low HCV and HIV co-infection rate found by Lodenyo *et al.* (2003) and Holland *et al.* (2000). However the figure obtained by Saravana *et al.* (2007) was low despite the fact that they assayed for HCV RNA. Muktar *et al.* (2006) assayed for anti-HCV antibodies only and yet found a high co-infection rate of 10.3%. In this study, only anti-HCV antibodies was used to screen for HCV infection. HCV RNA was not assayed for. If HCV RNA was assayed for, the actual co-infection rate would probably be higher than the present reported figure of 4.5%.

This study has certain limitations. Firstly, this is a cross-sectional study unable to adequately establish a casual relationship between the time of exposure and subsequent infection. Secondly, only anti-HCV antibodies was used to screen for HCV infection.

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