

## Prevalence of hepatitis C virus among human immunodeficiency virus infected patients and blood donors in Nigeria.

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### Abstract

HCV and HIV infections have emerged as a huge global epidemic. Co-infection with these viruses complicates an already complex set of issues related to diagnosis and clinical disease progression amongst others. Blood transfusion has been identified as one of the major routes of transmission of these viruses. This study sought to retrospectively evaluate the prevalence of HCV amongst two populations (HIV-infected patients on ARV and blood bags from 3 different blood banks).

Two hundred and sixty (260) sera samples from 3 different banks and 363 plasma samples from patients accessing ART were screened for antibodies to HCV by ELISA (ABBOT Murex, Kyalami, South Africa V.2.0) and further confirmed by Western Blot (Trinity Biotech, Bray, Ireland). Relative absolute CD4 count was evaluated in the two study populations (Dynal Oslo, Norway).

HCV contamination of blood bags varies amongst the blood banks with high prevalence in the transfusion centers where routine HCV screening is not done. HCV/HIV co-infection is 12.0% as compared to 5.8% in the blood bags. The relative CD4 count was much lower in co-infection than HIV-infection alone. These findings raise important questions on the safety of blood transfusion as well as adequate monitoring of the current ARV program in Nigeria.

Keywords: *Hepatitis C*; HCV co-infection; tranfusion

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### Introduction

Hepatitis C virus (HCV) has reached epidemic proportion world wide. More than 1 million new cases of infection are reported annually, and it is believed to be more prevalent than hepatitis B (HBV) virus infection (1). In the USA alone, nearly 4 million persons are infected and 30,000 acute new infections are estimated to occur annually (2) with an estimated 8,000-10,000 annually deaths attributed to HCV infection. This trend is predicted to increase if effective intervention is not put in place. HCV infection is more prevalent in underdeveloped countries and treatment is financially out of reach for most patients.

The factors most strongly associated with infection are injection-drug use and receipt of a blood transfusion and blood products (3). Other risk factors are poverty, high risk sexual behavior, maternal fetal transmission especially in association with co-infection with HIV in the mothers (4), percutaneous medical procedures (both traditional and non traditional) (5) (6) venous catheterization, dental treatment and circumcision in settings without sterilization capability (6).

Blood transfusion had been shown to play a very important role in HCV transmission in West Africa especially amongst sickle cell disease sufferers where prevalence rate is as high as 17% in Benin (7). In Egypt prevalence of HCV amongst the blood donors is as high as 24.8% (8).

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Approximately 35% of HIV infected patients are co-infected with HCV, possibly due to the sharing of the same parenteral route of infection by the two viruses (9). Co-infection with these viruses complicates issues related to diagnosis, clinical; disease progression, monitoring disease activity treatment options and basic immunology (10). Although HCV has been reported in Nigeria by a number of workers (11), (12), (13), no information is available on the prevalence of HCV in HIV infected patient and blood donors.

This study therefore attempts to study the prevalence of HCV/HIV infection in Nigeria during this era of massive antiretroviral therapy since HCV co-infection has a negative impact on the long term outcome of HIV disease. This study will also attempt to update the degree of transfusion associated HCV infection in Nigeria. Antibodies to HCV by ELISA (ABBOT Murex, Kyalami, South Africa version 2.0).

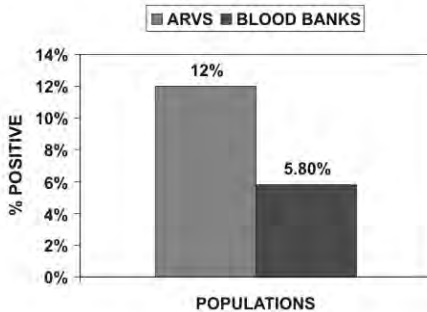
## Methods

Two hundred and sixty (260) sera samples were collected from 3 different blood banks in different locations in Nigeria, while 363 plasma samples from HIV-infected patients accessing ART were collected and screened for the positive samples were further confirmed by Western Blot (Trinity Biotech, Bray, Ireland). The relative absolute CD4 count were evaluated in 7 HIV/HCV co-infected patients and 8 HIV-infected patients by manual dynal CD4 assay (Dynal, Oslo, Norway).

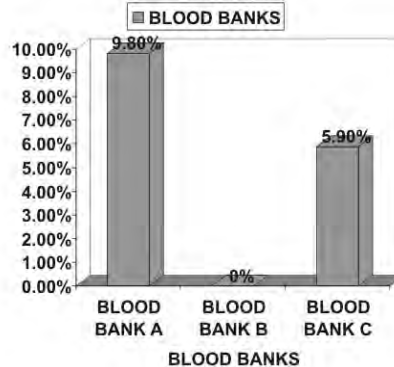
## Results

Forty-three (43) patients out of the 363 HIV infected patients and 15 out of 260 blood banks samples were tested positive giving 12.0% and 5.8% positively respectively in the two groups (fig 1) The CD4 measurement amongst the HIV/HCV co-infected patients showed a lower average cell count relative to those with only one infection. The average number of CD4T-cell count was 235.6 cells/ $\mu$ l in HIV-infected individuals while 143.9 cells/ $\mu$ l was recorded in HIV/HCV co-infected patients. HCV prevalence varies among the three blood banks A, B and C (9.8%, 0% and 5.9% prevalence respectively). Blood bank B with zero prevalence (Fig 2) was the only one of the 3 banks with a program of routine HCV screening.

*fig. 1*  
Percentage HCV prevalence in HIV-Patients infected and the blood banks



*fig. 2*  
Percentage HCV prevalence in the blood banks



## Discussion and conclusion

The observed high prevalence of HCV infection in HIV infected patients and the reduction in CD4 T-cells are in agreement with some previous studies (14), (15), (16). Studies have shown that persons with HCV/HIV co-infection 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 (15). This high prevalence is a pointer to the need to include HCV screening in monitoring protocol of ART as Nigeria scales up this programme.

Also the presence of anti-HCV antibodies in the blood banks samples is a major concern on the safety of blood transfusion and the need for compulsory HCV screening of blood before transfusion. The fact that Nigeria has a large population of people with sickle cell anemia, who often need transfusion during crisis, makes safe blood transfusion a must so as to prevent complicating an already ugly situation.

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