

**Short Research Article****SEROPREVALENCE OF HEPATITIS B AND C VIRUS INFECTIONS AMONG  
SEROPOSITIVE HIV PATIENTS ACCESSING HEALTHCARE IN A TERTIARY  
HEALTH CARE FACILITY IN NORTH-CENTRAL NIGERIA****Abstract**

Infections of Hepatitis Band C viruses among seropositive Human immunodeficiency virus patients are a growing public health problem in Sub Saharan Africa characterized by unaffordable treatment, severe morbidity and associated mortality. This study was aimed at evaluating the seroprevalence of Hepatitis B and C virus infection among seropositive HIV patients accessing health care at Federal Medical Centre, Keffi. The cross-sectional study took place between May-July 2016. A total of 200 blood samples were collected from HIV patients after informed consent and self-administered questionnaires were completed. The samples were centrifuged and the serumscreened for HBV and HCV using the immunochromatographic technique. A general prevalence of infection with hepatitis B and C viruses in the study population was 17.5%. The prevalence of HBV infection was 12.5% while HCV was 5.0%. Females have higher infection rates for both viruses ( $p > 0.05$ ). HBV infection was highest among those aged 20-29 years (14.3%) and lowest among those aged 30-39 years (6.5%). HCV infection was highest among those aged  $> 40$  years (8.7%) and least among those aged 30-39 years (0.0%). Infection rates with blood transfusion, smoking habit, scarification marks and alcohol intake as risk factors were more for HBV than HCV ( $p > 0.05$ ). The HIV/HBV and HIV/HCV coinfection prevalence of 12.5% and 5.0% respectively is a cause for concern. This finding underscores the urgent need for more proactive HBV immunization programs and screening of HIV patients for HBV and HCV before and even during antiretroviral therapy. Health education against these silent killers should be advocated.

**Keywords: HBV, HCV, HIV, Keffi, Seroprevalence****1. Introduction**

Human immunodeficiency Virus (HIV), Hepatitis B virus (HBV), and Hepatitis C virus (HCV), are the three most common chronic viral infections all over the world. They share similar

29 transmission routes including sexual, blood-blood contact, and injecting drug usage [1,2]. Co-  
30 infection with HIV and HCV and/or HBV is very common in certain populations, such as  
31 intravenous drug users (IDUs) who often share the contaminated needles/syringes for  
32 intravenous drug injection. It has been reported that the world prevalence of HIV-HCV co-  
33 infection among IDUs can surpass 90% in certain populations [3].

34 Both hepatitis B virus and hepatitis C virus are equally endemic across Africa. The prevalence of  
35 mono-infection for hepatitis B infection in the general population in Nigeria ranges from 9% to  
36 39%, and being above 7% considered hyperendemic [4]. HCV infection rate in Nigeria is also  
37 considerably high ranging from 5.8% to 12.3% [4]. Due to the endemic nature of these viruses in  
38 the sub-Saharan region and the shared routes of transmission, co-infections of HIV-HBV or  
39 HIV-HCV or even HIV-HBV-HCV are not uncommon. Prevalence of co-infection varies  
40 depending on the population studied [5].

41 With the introduction of highly active retroviral therapy (HAART), more people are living  
42 longer. However, this gain is being threatened by the emerging challenges posed by co-morbidity  
43 with other viral infections like HBV and HCV and unfortunately while HBV is vaccine  
44 preventable, HCV is not yet [5].

45 Expert guidelines developed in the United States and Europe recommend screening of all HIV-  
46 infected persons for infection with HCV and HBV and appropriate management of those found  
47 to be chronically infected [2]. In Nigeria, however, HIV-infected patients are not routinely  
48 screened for hepatitis viruses. Screening for HBV and HCV is only considered following  
49 observed deranged liver enzymes. Thus, there is no room for early detection of co-infections and  
50 institution of proper management of cases. Again, data on the prevalence of co-infection in our  
51 environment are still relatively scarce. This study is, therefore, aimed at determining the  
52 prevalence of HBV and HCV infections in seropositive HIV patients in a tertiary healthcare  
53 facility in North-Central, Nigeria.

54

## 55 **2. Materials and Methods**

### 56 **2.1 Study Area and Population**

57 The area of study for this research was Keffi. It is approximately 68Km from Abuja, the Federal  
58 Capital Territory and 128Km from Lafia, the capital of Nasarawa State. Keffi is located between  
59 latitude 8 5’N of the equator and longitude 7 8’E and situated on an altitude of 850m above sea  
60 level [6].

61 The study population was made up of 200 consenting patients accessing ART clinic at Federal  
62 Medical Centre, Keffi, Nigeria who were randomly selected from both sexes. Socio-demographic  
63 information of the participants was obtained through oral interview. Such information included;  
64 age, sex, occupation and history of blood transfusion.

## 65 **2.2 Sample Collection**

66 About 5ml of blood was collected from each participant by venipuncture into a sterile plain  
67 universal container. The blood was allowed to clot for 30 minutes and centrifuged at 3000 for 5  
68 minutes. A Pasteur pipette was used to harvest and dispense each serum into a new, labeled plain  
69 tube and stored at -20<sup>0</sup> C until ready for use.

## 70 **2.3 Ethical Approval**

71 Approval for this study was obtained from the Ethical Review Committee on Human Research,  
72 Federal Medical Centre, Keffi, Nigeria.

## 73 **2.4 HBsAg Detection**

74 A rapid in vitro which is a qualitative sandwich immunoassay diagnostic kit was used for  
75 screening the sera for HBsAg. The test kit (Healgen one step strips, Zhejiang Orient Gene  
76 Biotech Ltd, China) utilizes a combination of monoclonal and polyclonal antibodies to detect  
77 HBsAg in serum. The test procedure and result interpretation were carried out according to the  
78 manufacturer’s instructions.

## 79 **2.5 Anti-HCV Detection**

80 A rapid in vitro diagnostic kit (HCV one step strip, Zhejiang Orient Gene Biotech Ltd, China)  
81 was used for the detection of anti-HCV in serum. This kit uses recombinant proteins and  
82 synthesized peptides derived from core and structural regions of HCV for the detection of anti-  
83 HCV in serum. The test procedure and result interpretation were carried out according to the  
84 manufacturer’s instructions.

## 85 **2.6 Statistical Analysis**

86 The data obtained were subjected to descriptive statistical analysis using SPSS version 17.0.  
 87 Chi-square statistical test was used to determine associations and values obtained were  
 88 considered statistically significant at  $p \leq 0.05$ .

89

90 **3.0 Results**

91 Two hundred seropositive HIV patients were recruited for this study. Among them were 104  
 92 (52.0%) males and 96 (48.0%) females. The overall prevalence of hepatitis in these HIV patients  
 93 was 17.5%. Of these, 5.0% were reactive to anti-HCV and 12.5% to HBsAg. Females had higher  
 94 infection rates for both viruses ( $p > 0.05$ ).

95 HBV infection was highest among those aged 20-29 years (14.3%) and lowest among those aged  
 96 30-39 years (6.5%). For HCV infection, it was highest among those aged  $> 40$  years (8.7%) and  
 97 least among those aged 30-39 years (0.0%). Infection rates with blood transfusion, smoking  
 98 habit, scarification marks, alcohol intake as risk factors were more for HBV than HCV ( $p > 0.05$ )

99 **Table1: Prevalence of Hepatitis B and C virus Infection among seropositiveHIV patients accessing healthcare**  
 100 **in Federal Medical Centre, Keffi, Nigeria with respect to some demographic variables.**

Risk factors	No. Examined	No. Positive			
		HBV (%)	p value	HCV (%)	p value
<b>Gender</b>					
Male	104	12(11.5)	0.7059	4(3.8)	0.4587
Female	96	13 (13.5)		6(6.3)	
<b>Age (Years)</b>					
10-19	29	7 (24.1)	0.2437	2 (6.9)	0.2167
20-29	56	8 (14.3)		2 (3.6)	
30-39	46	3 (6.5)		0 (0.0)	
$>40$	69	7 (10.1)		6 (8.7)	
<b>Marital Status</b>					
Single	91	15 (16.5)	0.2731	3 (3.3)	0.5823
Married	98	8 (8.2)		6 (6.1)	
Divorced	11	2 (18.2)		1 (9.1)	
<b>Occupation</b>					
Students	40	10 (25.0)	0.1011	1 (2.5)	0.3195
Farmers	57	5 (8.2)		1 (1.8)	
Unemployed	39	1 (2.6)		4 (10.3)	
Artisans	45	6 (13.3)		2 (4.4)	
Civil servants	19	3 (15.8)		2 (10.5)	
<b>Educational Level</b>					
Primary	14	4 (28.6)		0 (0.0)	
Secondary	95	13 (13.7)		2 (15.4)	

Tertiary	91	8 (8.8)	0.1954	8 (8.8)	0.0970
<b>Scarification Marks</b>					
Tribal marks	20	3(15.0)	0.6163	0 (0.0)	0.3552
Tattoo	7	0 (0.0)		1 (14.3)	
No Scarification mark	173	22 (12.7)		9 (5.2)	
<b>Smoking Habit</b>					
Yes	8	0(0.0)	0.3085	1 (12.5)	0.3605
No	192	25 (13.0)		9 (4.7)	
<b>History of Blood Transfusion</b>					
Yes	49	3 (6.1)	0.1621	2 (4.1)	0.7460
No	151	22 (14.6)		8 (5.3)	
<b>Locality</b>					
Rural	121	20 (16.5)		3 (2.5)	
Urban	79	5 (6.3)	0.0573	7 (8.9)	0.0555
<b>History of Alcohol intake</b>					
Yes	77	12 (15.6)	0.3597	3 (3.9)	0.5890
No	123	13 (10.6)		7 (5.7)	

101

102 **4.0 Discussion**

With the increased access to antiretroviral therapy in resource limited settings, people living with HIV/AIDS will continue to live longer. However, morbidity and mortality due to co-infections with other viruses will increasingly become important. Although co infections with HBV and HCV 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 new data on hepatitis coinfections to guide health policy on management of HIV coinfecting patient is very important [7].

The prevalence of hepatitis carriage among seropositive HIV patients in this study was 17.5%. This is higher than findings of 15.5% in a study in HIV infected patients [8], 3.9% among patients [9] in Nigeria, 13.9% in Kano [10], 0.6% in Benin [2].

HBsAg the seromarker used for the detection in this study was found in 12.5% of the HIV patients. This prevalence was lower than findings of 15.5% in Benin [2], but higher than findings of 3.0% in Lafia [5], 7.9% in Abuja [11], 3.9% in Lagos [9] and 12.3% in Kano [10] among HIV seropositive patients. Similar studies from other countries found 30.9% in Cote d’voire [12],

6.0% in Kenya [7] 1.16% in Pakistan [13], 10.3% in Brazil [1]. These differences in prevalence might be as a result of geographical location, population and sensitivity of tests used for screening.

Similarly, the HCV/HIV coinfection in the present study was 5.0% i.e more than 2 times less than that of HBV among these patients. This is higher than reports of 1.6% in Kano [10], 2.3% in Abuja [11] but lower than 7.0% in Benin [2], 14.7% in Lagos [9]. Similar studies from other countries recorded 4.6% in Brazil [1], 10.3% in Kenya [7] and 1.42% in Pakistan among pregnant women [13]. The high prevalence recorded in the study especially with no obvious efficient risk factor as reported by other researchers might be connected with the fact that the transmission efficiency is determined by the amount of virus in a body fluid and the type and extent of the contact [14]. Unfortunately unlike HBV, HCV does not have vaccine yet.

On the whole, the prevalence of HIV/HBV and HIV/HCV in these HIV patients might be a reflection of the viral prevalence in their community and thus risk factors is same for every member of their community.

Gender was not found to be associated with the viral prevalence although both infections were higher among females than males ( $P > 0.05$ ). This was contrary to observation reported from a study in Brazil [1] and in Kenya [7]. However, a similar study in Kano reported HBV higher in males [10] and in Lagos [9]. This is connected to the fact that females are more promiscuous in the study area and also practice unprotected sex with their partner in a polygamous setting.

The age stratification in this study shows no statistical significance in age in HBV and none in HCV prevalence. HBsAg was detected more among patients that were below aged 19 years old while anti-HCV was more among those aged above 40 years old. This might be suggestive that those in such age are more active and likely to engage in unprotected sex and are also not aware of immunization. This was also reported in a similar study in Kano [10].

The infections were not associated with marital status ( $p > 0.05$ ). It was highest in divorced for both virus. This might be unconnected that both viruses are mainly sexually transmitted and risky behavior is likely to have predisposed the participants to infection by the viruses. This was

also reported in a similar study in Brazil [1].

With reference to occupation, students recorded the highest seroprevalence (25.0%) for HBV infection while HCV prevalence was highest (10.5%) among civil servants. There was no statistically significant association between the viral infections and occupation. In a related development, the viral seroprevalence was highest among those with the lowest level of education and lowest among those with a tertiary education for HBV infection while for HCV infection, it was highest in secondary education level and least in primary education participants ( $p > 0.05$ ). Education has long been acknowledged to be of great value in our life. It helps in making useful decision and sourcing of information concerning health and healthy living. Flores *et al.*, [1] also reported same outcome in his study.

Scarification marks in HBV and HCV infections was highest among those with a tribal mark and tattoo mark respectively. There was no statistically significant difference between viral infections and scarification marks ( $p > 0.05$ ). Such was also reported in a similar study in Cote d'voire [12]. There was no statistically significant association between locality and the viral infections ( $p > 0.05$ ). It was higher in rural than urban for HBV infection and vice versa for HCV infection. It is similar to studies in Nasarawa state [8,15].

Smoking habit, history of blood transfusion and history of alcohol intake are not possible risk factors for hepatitis B and C viruses among the study population in this study ( $p > 0.05$ ). It was higher for HBsAg among those without a history of smoking habit, history of blood transfusion and a history of alcohol intake while for anti-HCV. It was higher among those that smoke [12.5%], those with no history of blood transfusion and those with no history of alcohol intake. Pennapet *al.* [16] in Nigeria, Kouassi M' Bengue *et al.* [12] in Cote d'voire and Agyeman and Ofori-Asenso, [17] in Ghana reported same in a similar study.

## **5.0 Conclusion**

The present study has shown a high burden of HBV (12.5%) and HCV (5.0%) among seropositive HIV patients in the study area. Gender, age, marital status, occupation, education level, scarification marks, smoking habit, history of blood transfusion, locality and history of

alcohol intake were not possible risk factors for HBV and HCV infections. This finding underscores the urgent need for more proactive HBV immunization programs and screening of HIV patients for HBV and HCV before and even during antiretroviral therapy. Health education against these silent killers should be advocated.

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