Prevalence of Hepatitis C Virus among Individuals Living with HIV Infection in Ogbomoso

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ABSTRACT

Hepatitis C virus affects 5-15% of the 38 million people living with HIV globally. Individuals living with HIV are six times more likely to contract HCV than those without HIV. Hepatitis C virus (HCV) infection has been associated with liver disease including liver cirrhosis and hepatocellular carcinoma (HCC) in chronically-infected persons. However, in HIV/HCV co-infected individuals, increased rate of progression to cirrhosis and HCC has been reported This study is aimed at determining the prevalence of HCV infection among HIV positive individuals attending the antiretroviral clinic, Oyo state general hospital, Ogbomoso.

In this cross-sectional study, 392 individuals living with HIV were recruited for the study. Socio-demographic data were collected using a structured questionnaire. Blood samples were collected and qualitative screening was performed to detect the presence or absence of HCV antibodies in the blood samples using Rapid Diagnostics Test (Nantong Egens Biotechnology Co., Ltd., China.) according to the kit manufacturers instruction.

HCV antibodies was not detected in any of the 392 samples, resulting in a seroprevalence rate of 0.0%. The gender distribution showed a higher percentage of female, with 71% female and 29% male participants. Marital status showed, 62.5% were married, 15.8% single, 17.9% widowed, and 3.8% divorced or separated. Additionally, 20.4% had undergone blood transfusion, 6.6% engaged in unprotected sex, and 1.5% reported intravenous drug use (IDU).

This study found no evidence of HIV/HCV co-infection. This result may be attributed to the low prevalence of high-risk behaviors, as indicated by the 0.0% incarceration rate and the minimal proportion (1.5%) of intravenous drug users. However, the exclusive use of RDTs may underestimate true prevalence. Routine confirmatory screening using PCR or ELISA and continuous public health sensitization are recommended to prevent co-infection and improve outcomes.

Keywords: Hepatitis C Virus (HCV), HIV co-infection, Prevalence, Epidemiology, Ogbomoso

INTRODUCTION

Hepatitis C Virus is an important human pathogen and a viral infection that affects the liver thereby increasing the risks for chronic liver diseases, which include steatosis, fibrosis, liver cirrhosis and hepatocellular carcinoma (Baeka et al., 2021).

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HCV is one of the major causes of death and morbidity globally with an estimated 50 million people living with chronic hepatitis C virus infection. About 1.0 million new infections occur per year (WHO, 2024b), and 244 000 people die as a result of HCV yearly (WHO, 2024a). Currently, about 10 million people are infected with hepatitis C in Africa. Although diagnostic tools and effective treatments exist, more than 90% of individuals with hepatitis B and C in Africa do not receive the essential care they need (WHO, 2024b).

Both HIV and HCV share a similar mode of transmission (Innocent-Adiele et al., 2021) including percutaneous exposure to blood or blood products, sexual intercourse, and perinatal transmission.

The reported prevalence of HCV/HIV coinfection has varied from place to place and region to region. Prevalence rates as high as 36.4% has been reported in Mexico (Jose-Abrego et al., 2024), 16.1% in Malaysia (Akhtar et al., 2021), with prevalence as low as 0.5% having also been reported in Nigeria (Oshun et al., 2023), 0.83% in Congo (Thompson et al. 2022). This variation suggests that the prevalence of HIV/HCV co-infection may differ across geographic regions, likely influenced by the dominant risk factors present in each country (Jose-Abrego et al., 2024).

In Ogbomoso, the site of this study, there is a paucity of empirical data on the prevalence of HCV/HIV coinfection, thereby underscoring the necessity of this research.

Study Hypothesis: The prevalence of HCV infection among PLHIV in Ogbomoso is low, reflecting minimal exposure to high-risk behaviors.

MATERIALS AND METHODS

Study Area

Oyo state which is one of the states located in the South western region of Nigeria. and has 23 Local Government Areas. Ogbomoso is the second largest city in Oyo State with a population of approximately 683,000. The city lies within the Guinea savannah belt, with moderate climatic conditions and a mixed urban-rural setting.

Study Population

The study population constituted HIV seropositive individuals under clinical monitoring in the antiretroviral clinic in the State General Hospital, Ogbomoso, Oyo state, Nigeria. A total of Three hundred and nintey - two (392) participants were selected and enrolled for the study.

Inclusion and Exclusion Criteria

All consenting individuals with positive HIV diagnosis attending HIV clinic in Oyo state general Hospital, Ogbomosho were recruited for this study. Patients who did not have their HIV status confirmed, were excluded from this study.

Sample Collection, Preparation and Storage

Five milliliters of blood samples was collected through venipuncture into vacutainer bottles. The samples were then spun at 4000 rpm for 10 minutes to separate the serum from the whole blood. Samples were clearly identified with codes in order to avoid misinterpretation of results.

Serological Analysis

Serum was tested for the qualitative detection of HCV antibodies using Rapid Diagnostic Test kit (Nantong Egens Biotechnology Co., Ltd., China). The serologic test and interpretation of results were done according to instructions of the kit manufacturer.

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Data Analysis

Descriptive analysis was performed to summarize data obtained. Differences among groups were compared using Chi-square tests for categorical variables. P values <0.05 were considered statistically significant. Data analysis was done using IBM SPSS Statistics, version 25 (IBM Corp).

RESULTS AND DISCUSSION

Results

Demographic characteristics of the study population

Characteristics of the study group are highlighted in Table 1. A total of 392 study participants were included in the study. The study participants are a diverse group in terms of their age, gender, marital status, education, occupation, ethnicity, and religion. There was female preponderance with a proportion of 278 (70.9%) compared to males 114 (29.1%). The gender distribution showed a female-to-male ratio of 2.4:1. A vast majority of the study participants were between the ages of 37 and 54 years (48.7%), with a smaller proportion under the age of 18 (7.9%) with those aged 55 years and above accounting for 15.1%.

Many (49.1%, n = 111) of the study participants were found to be married. About 46.5% (n = 105) of them were single, while a few (4%, n = 10) were widowed.

Table 1: Socio-demographic characteristics of study participants

Variable	Categories	Frequency	Percent
Age	< 18	31	7.9
	19-36	111	28.3
	37-54	191	48.7
	>55 years	59	15.1
Gender	Male	114	29.1
	Female	278	70.9
Marital status	Single	62	15.8
	Married	245	62.5
	Divorced/Separated	15	3.8
	Widow	70	17.9
Education	No formal education	49	12.5
	Primary school	127	32.4
	Secondary school	147	37.5
	ONC/NCE	42	10.7
	HND/BSC	26	6.6
	Master degree	1	0.3
Occupation	Unemployed	64	16.3
	Self employed	255	65.1
	Civil servant	33	8.4
	Others	40	10.2

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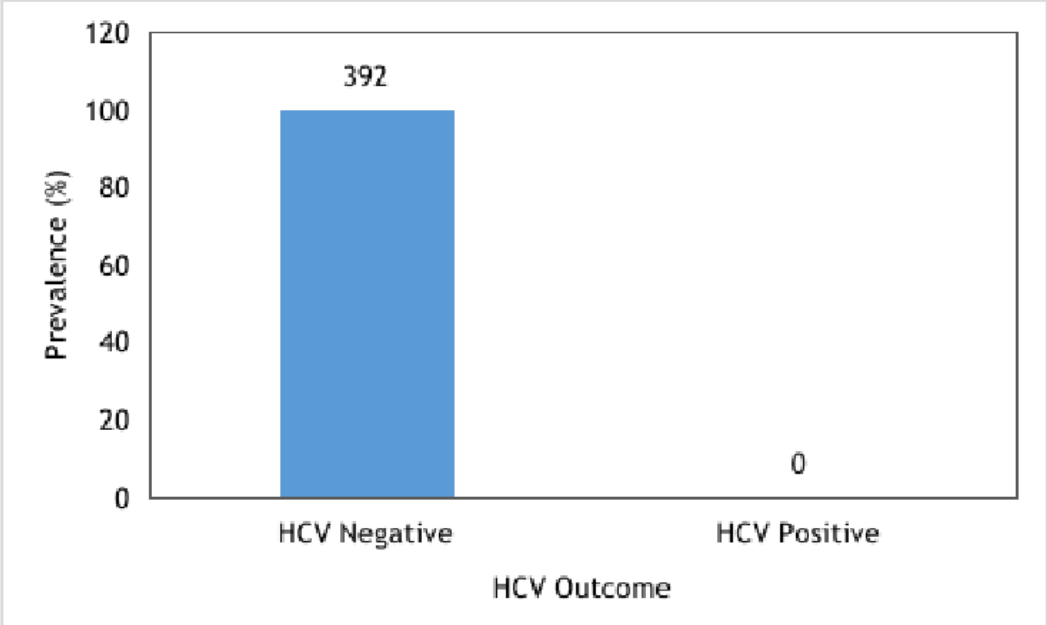
Ethnicity	Yoruba	355	90.6
	Hausa	16	4.1
	Igbo	19	4.8
	Others	2	0.5
Religion	Christianity	258	65.8
	Islamic	131	33.4
	Traditional	2	0.5
	Others	1	0.3

HCV Seroprevalence

Analysis for HCV antibodies using the RDT kit revealed a prevalence rate of 0.0% for HCV. However, the 95% confidence interval for prevalence (0.00–0.76%) was calculated, showing the possible upper bound of undetected infection.

Figure 1. Seroprevalence of Anti-HCV antibodies among HIV infected individuals



Analysis of Risk Behaviours Among Study Participants

The risk behaviors and medical history among study participants show that the majority of individuals do not engage in unprotected sex (93.4%), while 6.6% report engaging in unprotected sex. The majority have only one sexual partner (67.6%), with smaller proportions having two (13.5%) or more than two partners (0.5%). A significant portion (18.4%) reported having no sexual partners. Intravenous drug use is uncommon, with only 1.5% of participants reporting it, while most (98.5%) do not engage in it. A total of 20.4% of participants have had a blood transfusion, and 7.1% have undergone a surgical procedure, while the vast majority have not (92.9%). In terms of alcohol consumption, 14.8% of participants drink alcohol, while the majority (85.2%) do not. Notably, none of the participants have ever been incarcerated.

Table 2: Risk behaviors and medical history among study participants

Variable	**Categories**	**Frequency**	**Percent**
Engage in Unprotected sex	Yes	26	6.6

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	No	366	93.4
Number of Sexual partners	One	265	67.6
	Two	53	13.5
	> Two	2	0.5
	None	72	18.4
Intravenous Drug Use	Yes	6	1.5
	No	386	98.5
Blood transfusion	Yes	80	20.4
	No	312	79.6
Surgical Procedure	Yes	28	7.1
	No	364	92.9
Alcohol Intake	Yes	58	14.8
	No	334	85.2
History of incarceration	No	392	100.0

DISCUSSION

HIV has been reported to be associated with a higher prevalence of both Hepatitis B and C in Sub-Saharan Africa and these infections share a similar mode of transmission with HIV (Innocent-Adiele et al., 2021). In Nigeria, hepatitis co-infection with HIV is linked with an increase in morbidity and mortality (Cookey et al., 2021). Consequently, coinfection with HCV was assessed.

The findings indicate a 0.0% prevalence rate of HCV among HIV-positive individuals. This study aligns with estimates reported in prior studies Cookey et al., (2021) who also found the 0.0% prevalence rate of HCV antibody among PLHIV in Rivers state Nigeria, Opaleye et al., who reported a 0.0% HIV/HCV coinfection prevalence among pregnant women in southwestern Nigeria in 2016.

Some studies have also documented relatively low rates of HIV and HCV coinfection. For example, Oti et al. (2019) reported a 0.8% prevalence of HIV/HCV coinfection among pregnant women in Keffi, Nigeria. Although these investigations were not limited to individuals already diagnosed with HIV, their results indicate that HIV/HCV coinfections is not common.

In contrast, higher co-infection rates of 4.4% Baeka et al., (2021) and 4.3% Ugwu et al., (2023) have been reported in the country. The study also contradicts the 14.6% and 15.0% reported by Adesegun et al., (2020) and Newton et al., (2021) in Abeokuta.

Although correlation tests between behavioral risk factors and seropositivity were planned, they could not be performed due to the absence of HCV-positive samples. Nonetheless, descriptive analysis showed low exposure to risky behaviors within this population. Just 6.6% had ever had unprotected sex, and none had ever been in prison. These findings support the conclusion that the low rate of high-risk activity among this group may contribute to the lack of detection of HCV infection.

However, exclusive reliance on RDTs limits diagnostic accuracy. Studies have demonstrated that HCV Rapid Diagnostic Tests (RDTs) can yield false-negative results (Jargalsaikhan et al., 2020). This limitation highlights the importance of incorporating more sensitive follow-up tests in future studies.

Socio-cultural factors likely influenced the outcome of the study. The high rate of monogamous relationships and relatively low participation in intravenous drug use may have reduced exposure to HCV modes of

transmission in Ogbomoso. Despite this, knowledge gaps, limited utilization of confirmatory testing, potential underreporting of stigmatized behaviors remain possible sources of bias.

CONCLUSION

This study found no evidence of HIV/HCV co-infection among 392 HIV-positive individuals in Ogbomoso. This result may be attributed to the low prevalence of high-risk behaviors, as indicated by the 0.0% incarceration rate and the minimal proportion (1.5%) of intravenous drug users. Additionally, the high numbers of individuals that were married 245 (62.5%) may reduce risk exposures. Despite the 0.0% prevalence rate, the risk remains, (particularly in immunocompromised individuals) as well as significant gaps in HCV awareness, screening, and treatment accessibility. Routine screening and early public health sensitization are therefore crucial to mitigate the risk of co-infection and improve disease outcomes.

Ethical Approval

Ethical Approval was obtained from the Ethical Review committee of the Oyo state ministry of Health.

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COMPETING INTERESTS: Authors have declared no competing interests.

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