HUMAN IMMUNODEFICIENCY AND HEPATITIS B VIRUS COINFECTION IN A REFERRAL HOSPITAL, SOUTHERN NIGERIA

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ABSTRACT

BACKGROUND: *Liver-related disease is the leading cause of non-HIV-related mortality among HIV persons with access to antiretroviral drugs. Persons with HIV and HBV coinfection are at increased risk of serious, life-threatening complications. Coinfection rates reflect the impact of prevention/control activities geared towards these infections. The aim of this study was to determine the prevalence of HIV and HBV coinfection in the University of Port Harcourt Teaching Hospital and the age and sex distribution of co-infected individuals.*

METHODS: *A desk review of laboratory records from July 2015 to June 2016. Serologic Test results for HIV and Hepatitis B surface antigen (HBsAg), age and sex distribution were extracted and the proportion of coinfected individuals noted. Descriptive and inferential statistics were employed using independent t test, Chi square and Fishers exact tests as appropriate. Alpha level was set at 0.05.*

RESULTS: *Among the 752 persons positive for HIV 1/2, fourteen were also positive for Hepatitis B surface antigen, giving a HIV/ HBV coinfection rate of 1.9%. Of these, seven (2.4%) of males and seven (1.6%) of females were co-infected. Mean age of subjects was 33.0 ± 12.4years. No statistically significant difference between the HIV mono-infected and HIV/HBV coinfected groups by age and sex was observed.*

CONCLUSION: *The prevalence of Hepatitis B/ HIV coinfection in Port Harcourt has reduced. This implies positive impact of prevention/control measures directed at these and other blood-borne pathogens. It is thus recommended that these strategies be strengthened with particular emphasis to males living with HIV.*

KEYWORDS: HIV, Hepatitis B, coinfection, Port Harcourt

INTRODUCTION

The Human immunodeficiency virus (HIV) and Hepatitis B virus (HBV) are pathogens of major health significance globally. HIV causes a chronic infection which results in varying degrees of immunosuppression with associated opportunistic infections and predisposition to various cancers[1]. It is associated with increased morbidity and mortality particularly in patients without access to highly active anti-retroviral therapy and those infected with drug-resistant strains. HBV can cause acute or chronic liver disease which is potentially life threatening due to the increased risk of chronically infected persons developing liver cirrhosis or hepatocellular carcinoma [2].

Human Immunodeficiency Virus (HIV) and Hepatitis B virus (HBV) coinfection which refers to concomitant infection with both viruses occurring in an individual occurs because both are blood borne viruses therefore the modes of transmission of HBV and HIV are quite similar and this is usually via sexual contact (notably among men who have sex with men (MSM)) or contact with bodily fluids of infected individuals as can occur in injection drug users [3].

The World Health Organization (WHO) reports that the global prevalence of HBV infection in HIV-infected persons is 7.4% and the burden of these coinfections are greatest in the African and South East Asian Regions [2].

In Asia and sub-Saharan Africa, the prevalence of HBV among HIV-infected individuals is estimated at 15-30%) [3,4]. However, variations in coinfection rates occur even

within the African region in the range of 1.1 to 28.4% [4]. The contribution of Africa to the global estimates is enormous because over 70% of people infected with HIV globally, live in Sub-Saharan Africa[4,6].

HIV and HBV coinfection is of concern because it is associated with higher rates of liver-related complications and mortality in HIV patients, thus worsening prognosis of HIV infection. In several studies, the risk of liver-related mortality has been found to be 2-3 times higher in HIV and HBV co-infected patients than in individuals infected with HIV without HBV (14% vs 6%)[3,7,8].

Whereas greater than 90% of immunocompetent individuals spontaneously clear HBV acquired in adulthood, HIV-infected persons are only half as likely to spontaneously clear HBV infection, therefore, chronic HBV infection occurs in 5-10% of HIV-infected individuals who are exposed to HBV, this rate being 10 times higher than that for the general population [3,9]. The impact of both infectious diseases on each other seems to be skewed more towards HIV worsening HBV infection, as recent studies have not shown HBV infection to have a substantial impact on patients' immunologic or virologic responses to Anti-Retroviral therapy or on progression to AIDS or HIV-related death [7,10,11].

Persons with HIV and chronic HBV coinfection are at increased risk for serious, life-threatening complications; they have higher levels of HBV DNA, lower rates of clearance of the Hepatitis B e antigen (HBeAg), increased risk of cirrhosis and end-stage liver disease [12,13]. They are also reported to have more frequent flares of hepatic transaminases, which can occur either spontaneously, with immune reconstitution inflammatory syndrome (IRIS) owing to ART, or with interruption of / development of resistance to HIV or HBV treatment [14]. These make Liver-related disease the leading cause of non-HIV-related mortality in parts of the world where effective antiretroviral therapy (ART) is widely available) [15]. It also affects anti-retroviral therapy as it predisposes patients to increased risk of hepatotoxicity due to the underlying liver pathology and drug interactions, though the opportunity for simplification of treatment regimens using medications active against both HIV and HBV may be beneficial [4].

The coinfection rates reflect the impact of prevention/control activities geared towards these infections and thus provides a platform for review of policies or activities where necessary. This study was therefore carried out to determine the prevalence rate of HIV and HBV coinfection in the University of Port Harcourt Teaching Hospital and the age and sex distribution of co-infected individuals and thus assess the influence of prevention and control activities.

METHODS

A desk review of the Laboratory records of all serologic testing on all categories of patients for HIV and HBV performed in the Department of Hematology and Blood transfusion of the University of Port Harcourt Teaching Hospital over a one year period, between July 2015 and June 2016.

Serologic Test results for HIV and Hepatitis B surface antigen (HBsAg) were extracted from Laboratory records and co-infected individuals noted. Their age and sex distribution were also extracted. Serologic tests for antibodies to HIV I and 2 were performed on serum samples obtained from clients, following the Serial testing algorithm, using Determine kit (Alere) and Uni-Gold Kit (Trinity Biotech) while serology for HBsAg was performed using HBSAG Rapid test Strip (Hangzhou Biotest Biotech Co., Ltd, China and Citrus Diagnostics Inc., Canada). These were all done according to manufacturers' instructions. Internal controls were employed to ensure validity of tests.

Confidentiality was maintained as individuals' identities were not recorded and no direct contact with patients or their medical records was made.

Data was entered into an excel spreadsheet and analysed using the Statistical Package for *Social Sciences (SPSS) version 20*. Descriptive statistics in the form of means, standard deviation, frequencies and proportions was performed while inferential statistics was employed using independent t test, Chi square and Fishers exact tests as appropriate. Alpha level was set at 0.05.

RESULTS

Study subjects were within the age Range of 0.16 – 83 years with a mean age of 33.0 ± 12.4years, with 295 subjects (39.2%) being male and 448 (59.6 %) being female (Table 1).

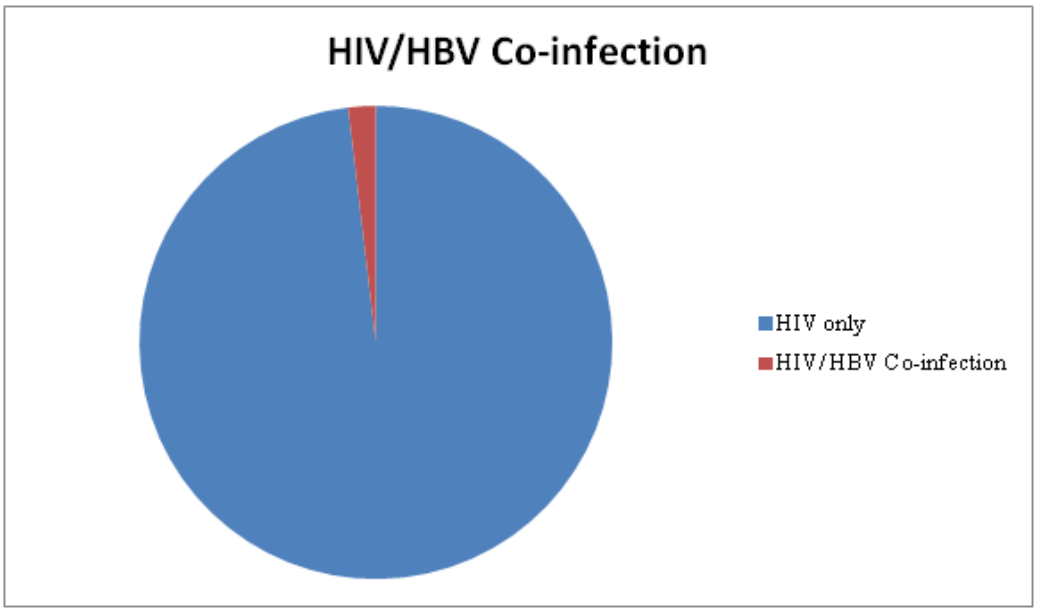
TABLE 1: Demographic characteristics of HIV patients in the study (N=752)

Variables	N	%
Age category (years)		
≤5	20	2.7
6 – 12	15	2.0
13 – 19	21	2.8
20 – 29	161	21.4
30 – 39	206	27.4
40 – 49	103	13.7
50 – 59	34	4.5
≥60	16	2.1
Ns*	176	23.4
Mean ± SD: 33.0±12.4years; Range: 0.16– 83 years		
SEX		
Male	295	39.2
Female	448	59.6
Ns	9	1.2

SD-Standard deviation Ns-Not specified **Adults* used and not exact age

Among the 752 HIV positive persons, fourteen were also positive for Hepatitis B surface antigen, giving a HIV/HBV coinfection rate of 1.9% (FIGURE 1).

FIG 1: Prevalence of HIV/HBV coinfection



Coinfected persons had a mean age of 31.7 years ± 5.36, being slightly lower than the mean age of subjects who were not HIV/HBV coinfected; however, this difference was notstatistically significant (Table 2).

Table 2: Comparison of mean ages of HIV patients with/without Hepatitis B coinfection

	HIV / Hepatitis B coinfection			
	Positive	Negative		
	Mean age ± SD	Mean age ± SD	t	P-value
Age in years	31.7 ± 5.36	33.1 ± 12.46	0.342	0.733

SD-Standard deviation

There was equal male to female ratio among the fourteen coinfected persons but a higher percentage of males infected with HIV (2.4%) than females (1.6%) were coinfected, though this difference was not statistically significant (*p=0.42*) (Table 3)

TABLE 3: Comparison of HIV / Hepatitis B coinfection by sex of the patients

	HIV / Hepatitis B coinfection		
	Yes	**No**	**Total**
Sex	**n (%)**	**n (%)**	**n (%)**
Male	7 (2.4)	288 (97.6)	295 (100.0)
Female	7 (1.6)	441 (98.4)	448 (100.0)
Total	**14 (1.9)**	**729 (98.1)**	**743 (100.0)**

Chi square=0.632; p-value=0.427

DISCUSSION

From the records reviewed, HIV and HBV coinfection rate was found to be 1.96%. This coinfection prevalence rate is similar to that observed in some other Nigerian and African settings such as that observed by Tounkara et al in Mali where a coinfection prevalence rate of 1.13% was recorded[16]. It is howeverlower than reported rates in other settings within Nigeria and Africa, with records of coinfection prevalence up to 28.4% [4,17,18].

Notable among these is the prevalence rate of 9.7% reported by Ejele *et al* (2004)[19]. This was reported from the same institution as ours and thus implies that the prevalence rate has reduced over time. This improvement which is a desirable development may have arisen due to interplay of a number of factors. It may be related to improved childhood and adult vaccination against Hepatitis B virus[20] which has contributed to sustained decline in the prevalence of HBV infection, as reported by the WHO and Musa *et al* (2015) [2,21]. \

Increased health awareness especially with increased access to internet facilities observed among Nigerians may also have contributed; over the past decades there has been a massive increase in access to internet service among Nigerians [22] even in some rural communities. This as well as more health enlightenment talks by governmental and non-governmental agencies has most likely improved knowledge on the modes of transmission of both viruses and the means of preventing them; particularly the Hepatitis B virus which hitherto was very alien to a majority of Nigerians.

There also seems to be increased access to laboratory testing/ screening due to subsidized and free screening often offered in some health facilities, including UPTH, thanks to donor agencies, and free medical outreaches. Such laboratory testing is carried out even without any clinical manifestations unlike previously when ill persons were those who would usually be sent for laboratory testing, such that more of the results obtained in health facilities were more likely positive. This also increases the likelihood of detecting more the infected persons in the population including the asymptomatic. .

A limitation of this report however, is the possibility of occult HBV infection which could account for false negative results obtained in infected persons tested for HBsAg as noted by researchers such as Oluyinka *et al* (2015), who found HBV DNA in 21/188 (11.2%) of HIV positive patients without detectable HBsAg [23].

The mean age of co-infected persons is within the age bracket of fresh graduates of higher institutions / active

young working class in our society thus the increased morbidity and mortality associated with HIV/HBV coinfection could lead to marked loss of manpower and work hours, with huge impact on our economy. This is also similar to a report from Ghana in 2016 which noted that peak ages for AIDS cases were within the most productive years being 25–34 years for females and 30–39 years for Males[24].

Some reports state a higher prevalence of coinfection in men most likely due to unprotected intercourse particularly among men who have sex with men (MSM) [3,25]. This raises the question of the burden of MSM among Nigerians particularly in the south-south geopolitical zone from where most clients of the facility are drawn. Our results however, showed no statistically significant differences between the HIV mono-infected and HIV-HBV co-infected groups by age and sex.

CONCLUSION

The prevalence of Hepatitis B/ HIV coinfection in Port Harcourt has reduced. This implies positive impact of prevention/control measures directed at these and other blood-borne pathogens. It is thus recommended that these strategies be strengthened with particular emphasis to males living with HIV.

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