Hepatitis B and HIV co-infection- experience in a rural/suburban health center in Nigeria


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ABSTRACT

Hepatitis B virus shares similar transmission patterns and risk factors with the human immune deficiency (HIV) virus. Both are endemic in Nigeria and co infection is likely. All adult patients that are HIV positive seen in the adult ART clinic over a six month period were investigated for hepatitis B infection by screening for hepatitis B surface antigen (HBsAG) as well as other baseline investigation such as CD4 count. There were 53 patients that tested positive for HBSAG out of a total of 1800 HIV positive patients enrolled in care during this period, giving a co infection prevalence rate of 3.2%. There were 36 males and 21 females, giving a male: female ratio of 1.7:1. The mean age was 36 ±16.6. The co infection rate in this centre is lower to that reported in other centres perhaps because of the suburban location of Irrua Specialist Teaching Hospital, Irrua. The sex distribution and CD4 counts are however similar to that reported by other studies.

There are serious implications of co infection with hepatitis B and HIV viruses and efforts should be made to make physicians managing these patients aware of their peculiarities.

Key Words: Hepatitis B, HIV co-infection. rural/suburban, health centre.

INTRODUCTION

Hepatitis B virus infection is one of the commonest hepatotropic viruses in our environment and it is a highly infectious disease that shares similar transmission patterns and risk factors with the human immunodeficiency virus (HIV) virus [1]. It is however ten times more infectious than HIV infection and also has a tendency for chronicity in the liver and later for malignant transformation of the liver [2]. It is the commonest cause of primary liver cell carcinoma in sub-saharan Africa [3]. Co infection with hepatitis B virus (HBV) in HIV-infected patients is common [1]. HBV does not significantly affect the course of HIV disease, but HIV does alter the course of HBV [2]. HIV-infected persons are less likely to clear acute HBV infection spontaneously, and HIV/HBV-co infected persons face a higher risk of liver-related death than those monoinfected with either virus. The immune restoration associated with highly active antiretroviral therapy (HAART) can improve control of HBV replication but can also lead to increased immune-mediated liver injury [2].

Because of the similar mode of transmission of the two viruses it is important to look at the rate of co-infection in this sub-urban setting.
This study therefore aims to look at the hospital prevalence and the demographics of HIV and hepatitis B viral co-infection in a sub-urban population of HIV patients in Irrua Specialist Teaching Hospital, Irrua Edo State Nigeria. This will hopefully contribute to the available literature on this subject in this part of Nigeria and West Africa.

MATERIALS AND METHODS

The study was conducted in the adult HIV clinic of Irrua Specialist Teaching Hospital, Irrua, Edo State Nigeria, located in the sub-urban town of Irrua Edo central senatorial district serving the populations of the northern part of Edo State as well as the neighbouring states of Delta, Kogi, and Ondo States. All adult patients that are HIV positive are referred to the clinic where baseline investigations such as hepatitis B viral screening via hepatitis B surface antigen (HBsAG) testing are done. Simple hepatitis B surface antigen (HBsAg) tests may facilitate ascertainment of hepatitis B virus (HBV) infection in settings with high endemicity but limited infrastructure [4]. This was done over an eighteen months period (1st June 2009 to 31st December 2010) and all patients that are co-infected are separated out and there case records are scrutinized for any peculiarities. The study was approved by the hospital ethics committee.

Statistical analysis was done using the computer Epi-info.

RESULTS

There were 53 patients that tested positive for HBSAG out of a total of 1800 HIV positive patients enrolled in care during this period, giving a co-infection prevalence rate of 3.2%. There were 36 males and 21 females, giving a male: female ratio of 1.7:1.

The mean age was 36 ±16.6.

The duration of therapy in the clinic ranges from 1 month to 2 years.

The average CD4 count at diagnosis was 289.32± 105.18 cell/ul with lowest being 18 cells/ul and the highest being 672 cells/ul.

30 of these patients were on antiretroviral therapy while 27 were not.

Only 6/53(10.5%) patients presented with features of hepatitis while the others presented with other pathologies such as PTB-15/53(26.3%), diarrhoea and weight loss- 6/53(10.5%).

The commonest ARV combination that the patients are on is stavudine/lamivudine/nevirapine-15/30(50%), and tenofovir/emtricitabine/nevirapine-15/30(50%).

The outcomes of therapy are as follows- 33/53(57.8%) are still on therapy, 12/53(21.1%) were transferred out to other facilities, 9/53(15.8%) were lost to follow up and 9/53(5.3%) died.

DISCUSSION

The prevalence rate for HIV/HBV co infection found in this study was 3.2%. An earlier study done by Okogbo et al [4] in this hospital among blood donors found a prevalence rate for HIV alone to be 1.74%, HBV alone – 1.44% and co-infection rate of 0.06%. Okokhere et al [5] found an HBsAG positive prevalence rate of 4.4% among blood donors in Irrua 5 years after the Okogbo et al study showing the rising incidence of HBV infection in the population of blood donors in Irrua Edo State. The seroprevalence of Hepatitis B in other parts of the world is however generally much lower as reported by researchers in India [6,7]. The observed prevalence rate of 3.2% in our HIV patients attending the adult ART clinic may be due to rural location of the site of the study but it is however an indication of the rising prevalence of HBV infection in this environment. In other centers around Nigeria and in other parts of the world, different prevalence rates have been reported depending on the location of the cohort of patients studied. Ejele et al [8] found a prevalence co-infection rate of 9.7% among their patients in the Niger Delta area of Nigeria whereas Idoko et al [9] in Jos Nigeria found a much higher HIV/HBV co infection prevalence rate of 16.7% among HIV patients studied in there centre in Northern Nigeria. Nwokedi et al [10] in Kano found a co infection prevalence rate of 70.5% in their studied patients whereas Iwalokun et al [11] found a co infection prevalence rate of 51.9% among their patients in Lagos. Also in the same south western part of Nigeria, Lesi et al [12] also in Lagos found a co infection rate of 9.2% while Otegbayo et al [13] found a co-infection rate of 11.5%
among the patients studied in Ibadan. All this findings reflect the different patient populations studied and the urban location of most of the study sites where similar studies were conducted in the past.

In other centers around Africa the co-infection rate also varies widely. In a Ghananian study by Geretti et al [14], a prevalence rate of 16.7% was found among the studied cohort similar to that reported by Idoko et al above [9]. Also in Cote d’ivoire, Rouet et al found a co-infection prevalence rate of 12.1% among children attending an HIV clinic in Abidjan [15]. Elsewhere in Europe, in the EuroSIDA cohort study by Konopnicki et al among several European HIV centres, an 8.7% HBSAG positive prevalence rate [16] was found among the HIV positive patient population. All these attest to the fact that the location of the study population determines the observed prevalence rate.

There were more males with HBSAG positivity compared to females despite an overall higher HIV prevalence rate in females reported in this centre [17]. In this study the male: female ratio was 1.7:1. This is similar to that observed by Gupta & Singh among Indian patients co-infected with HIV & HBV [18]. They found that the prevalence of HBsAg was higher (8.55%) in males than females (3.39%) in their study [18]. The male sex therefore appears to be a risk factor for HIV/HBV co-infection. The reason for this male preponderance is unknown despite more females being affected with the HIV virus. Otegbayo et al [13] also found that the HBsAg prevalence was more common among males than females (15.4% vs 10.1%, respectively p = 0.001) in their study similar to that observed in this study.

The mean CD4 count among our patients at enrolment and subsequent screening for HBSAG was 289.32± 105 with the lowest being 18 cells/ul and the highest being 672 cells/ul. This shows a wide highly variable initial CD4 count. This is in contrast to that found by Idoko et al [9] in Jos Nigeria where a mean CD4 count of 107 cells/ul was found among their HBV & HIV co-infected patients, as well as by Yako et al in Benue State Nigeria [19]. Otegbayo et al [13] also found a mean CD4 count of 247 cells/mm3 among their cohort of patients studied similar to that observed in this study. A higher CD4 count among our patients might be due to earlier presentation to the hospital before the disease is advanced and may be responsible for the relatively low mortality rate among our HIV/HBV co-infected patients. Only 5.3% mortality was recorded among our patients while 57.8% are still on active therapy. This observation is similar to that noted by Psevdos et al [20] that reported an interesting association of loss of HBsAg in HIV-HBV co-infected patients with higher CD4 cell count among co-infected patients they studied in New York. Similarly Hoffmann et al in a South African study concluded that HBV status does not affect HIV RNA suppression, CD4 cell count response, or mortality during the first 72 weeks of HAART in an African setting [21]. It therefore appears that a functioning immune system in HIV and HBV co-infected patients with very high CD4 cell count may enable a robust T-cell cytolytic response with production of anti-HBV cytokines such as interferon-gamma to help clear HBV infection in HIV co-infected patients. Therefore a higher baseline CD4 cell count will likely be significantly associated with loss of HBsAg in HIV and HBV co-infected patients and lead to an overall improved outcome [22].

In this study only 10.5% of the patients presented with features of hepatitis. The others presented with other HIV related co-morbidities such as pulmonary tuberculosis (26.3%) and diarrhoea and weight loss (10.5%). This shows that most of these infections (HBV) are clinically asymptomatic and most likely to be chronic. They are also most likely to be missed unless actively sought for.

Pulmonary tuberculosis may be a risk factor for clinical expression of chronic HBV infection because of the hepatotoxic effects of potent antituberculosis drugs used in its treatment [23]. Adebajo et al [24] in their study of the sero-epidemiologic associations among Nigerian patients found a stronger association (P < 0.001) between the presence of HBsAg and tuberculosis suggesting that HBsAg carriers might be at a higher risk of contracting tuberculosis.

The commonest ARV combination that the patients are on in this study is stavudine/lamivudine/nevirapine (50%), and tenofovir/emtricitabine/nevirapine (50%). This is majorly due to the choice of antiretroviral combinations available in this center. This antiretroviral combination is in agreement with previous workers on the subject that have found lamivudine and tenofovir useful major components of any antiretroviral combination to be used in patients co-infected with HBV and HIV [25]. Tenofovir is often used in combination with lamivudine for effective treatment of HBV in HIV-1-infected individuals, as both agents are active against HIV-1 as well as HBV. Recent work demonstrates that tenofovir reduces the HBV viral load significantly in HIV and HBV-co infected individuals infected with lamivudine-resistant HBV [26]. As well as being effective in individuals with lamivudine-resistant HBV, tenofovir is also effective in individuals who fail alpha interferon (IFN-α) therapy [27].
CONCLUSION

In conclusion, HIV infection because of its immune suppressing effect predisposes to many infections and HBV is just one of them. There is however serious implications of co infection with both organisms especially in resource poor suburban centers like the one in which this study was done. Efforts should be made to make physicians managing these patients aware of their peculiarities and how to look out for them and manage them effectively.

LIMITATIONS. Limited availability of funds prevented viral load studies as well as measurement of other serologic viral markers among the co infected patients.

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REFERENCES