ORIGINAL ARTICLE

Human Immunodeficiency Virus and Hepatitis B Virus Co- Infection among Patients in Kano Nigeria

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ABSTRACT

Background: *Human immunodeficiency virus and hepatitis B virus are widespread in the developing countries and patients with dual infection of HIV and HBV are increasingly being diagnosed among hospital patients. Reports have indicated that hepatitis will contribute significantly to morbidity and mortality in HIV infected patients because of increased use and accessibility of highly active antiretroviral therapy (HAART). The objective of this study is to determine the prevalence of HIV and HBV co- infection in patients in Kano Nigeria and to highlight the reciprocal interactions between the HIV and HBV.*

Methods: *Three hundred patients consisting of 152 males and 148 females were recruited into the study at the Aminu Kano Teaching Hospital Kano, Nigeria between February 2002 and March 2003.*

Results: *Out of a total of three hundred HIV positive patients, two hundred and eleven (70.3%) were HBV positive. Of the 152 males that are HIV positive, 102 (67.1%) were HBV positive while out of 148 females that are HIV positive, 109 (73.6%) were HBV positive.*

Conclusion: *A co- infection rate of 70.5% was observed in this study. Since HIV infected patients with HBV co-infection respond less to HAART, additional concern and care must be taken in order to minimize the complications associated with the increasing use of HAART.The testing of HIV positive patients for HBV will help in the choice of therapy in these patients's.*

KEYWORDS: HIV; HBV; HbsAg; Co-infection.

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INTRODUCTION

Human immunodeficiency virus (HIV) and Hepatitis B virus (HBV) co-infection has emerged as a major significant health problem among patients. The two viruses HIV and HBV share the same route of transmission and HBV is more efficiently transmitted than HIV[1]. Reports from workers worldwide indicate that HIV positive patients are more likely to be infected with HBV than HIV negative individuals[2]. Similarly, immunosuppression brought about by HIV infection may cause reactivation or re-infection in those individuals previously exposed to HBV [1-3]. HIV has been identified as a co-factor in HBV disease progression, increasing HBV replication levels and causing lower incidence of spontaneous loss of HBV antigens: HBeAg or HBsAg. HIV significantly increases the incidence of cirrhosis and death from liver disease in co-infected patients [1,2]. HBV and HIV are wide spread in the developing countries including Nigeria. A growing body of evidence indicates that HBV will contribute significantly to continuing morbidity and mortality in HIV infected individuals because of increasing widespread use of and accessibility of the highly active anti-retroviral therapy (HAART)[3] in sub Saharan Africa.

Unfortunately, not much has been reported in this region of HIV and HBV co-infections in patients and interaction between these two viruses when an individual carries both viruses.

The objective of this present study therefore was to determine the prevalence of HIV and HBV co-infection in patients who are confirmed HIV positive in Kano and are being seen at the teaching hospital. The study also highlights the reciprocal interactions between the HIV and HBV.

SUBJECTS AND METHODS

A total of three hundred subjects aged 12-59 years were recruited for the study between February 2002 and March 2003. They comprised of one hundred and fifty two (152) males, and one hundred and forty eight females. HIV antibodies screening was done using rapid HIV 1 and 2 assay based on the principle of latex agglutination (Capillus 1 and 2 Cambridge diagnostic, Callaway Ireland) and Genie 11 HIV-1 and HIV-2 (by Sanofi Pasteur, France). The seropositive sera were later confirmed by Immunoconfirm HIV 1and 2 test kit (Immunoconfirm by Orgenics, Israel). HBsAg was tested using latex agglutination technique with reagent supplied by Biotec Laboratories.Epi-info 2002 (X^2) was used to compare the prevalence between the various groups and values were considered significantly different at $p<0.05$.

RESULTS

Out of a total of three hundred HIV positive patients, two hundred and eleven (70.3 %) were HBsAg positive.

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They consisted of two hundred and sixty six (88.7%) ambulatory patients and thirty four (11.3%) in patients. Of the 266 ambulatory patients, 185 (69.5%) were HBsAg positive while 26 (76.5) of the 34 admitted patients were HBsAg positive Table I.

Table II indicates that of the 300 HIV infected patients, 152 (50.7%) of which were males and 148 (49.3%) were females. Of the 152 males. Co-infection with HBV was observed in 102 (67.1%) while 109 (73.7%) females were also co-infected out of a total of 148 patients.

Table III represents HIV and HBV co-infection rate among the various age groups. Thirty out of thirty two HIV positive under the age of 20 years were co-infected with HBV. 78 out of 117 within the ages of 21- 30 years were co-infected with HBV. Fifty-six out of 82 HIV infected patients were co-infected within the ages group 31-40 years. Similarly 33 of 55 and 14 of 14 were co-infected in the age group of 41-50 years and > 50 years respectively.

Table I. Co-Infection Rate of HBV and HIV among Admitted and Ambulatory Patients

Type of Patients	Total HIV Positive	Total HBsAg and HIV Positive (%)
Ambulant Patients	266 (88.7)	185 (69.5)
Admitted(IN) Patients	34 (11.3)	26 (76.5)
Total	300	211 (70.3)

x^2 @ 1dF and p<o. 001 = 15.5 (significant).

Table II. HIV and HBV Co-Infection Rate According to Gender

Sex	Total HIV Positive (%)	Total HIV-HBV Positive (%)
Male	152 (50.7)	102 (67.1)
Female	148 (49.3)	109 (73.7)
Total	300	211 (70.5)

X^2 @ 1 dF and P<O. 001 = 0.25 (insignificant).

Table III. HIV and HBV Co-Infection Rate among the Various Age – Groups in Kano

Age in years	Total N0. HIV Pos.	Dual HIV/HBV Pos.	(%)
< 20	32	30	(10)
21 – 30	117	78	(26)
31-40	82	56	(18.7)
41-50	55	33	(11)
>50	14	14	(4.7)
Total	300	211	(70.3)

X^2 @1 df and P0.001 = 15.5 (Significant)

DISCUSSION

Patients with dual infection of HIV and HBV were recently reported elsewhere [1,5,6]. There is evidence that HBV will contribute more to morbidity and mortality in HIV infected patients because of increased use and accessibility of the highly active antiretroviral therapy (HAART), since these patients will live longer. The introduction of HAART has led to a significant decrease in morbidity and mortality in the HIV infected patients. This allowed the expression of liver related complications associated with HBV chronic infections which is mainly acquired before HIV infection [4].

A co-infection rate of 70.5% was observed in this study. This was higher than 53% observed in Kisimu District Hospital in Kenya[3], 30.8% observed by Akolo[5] in Jos, Plateau state and 12.5% in Abuja by Odama at al [6]. A much lower rate of 9% was reported in a group of patients in 72 European HIV centres in a EuroSIDA cohort study. Although HBV is more effectively transmitted than HCV, the prevalence of HCV co-infection is much higher than that of HBV co-infection in developed world[7].It was observed that HIV infection exacerbates liver diseases in HBV co-infected patients and there is a greater risk of liver disease when HIV and HBV co-infected patients are treated with HAART. Akolo *et al*[5] observed that HIV and HBV co-infected patients had lower rate of rise of their $CD4^+$cell counts when they are on HAART than their counter-parts who are HIV infected without HBV co-infection on the same therapy. It was concluded that all patients should be screened for HBV infection before commencement of HAART.

In Europe, liver disease is currently one of the leading causes of morbidity and mortality in co-infected patients. Several non-exclusive pathogenic processes that include drug-related hepatotoxicities, chronic hepatitis B or C infection, steartosis or non-alcoholic Steartohepatitis have been reported[4,9,10]. There is a reciprocal interaction between HBV-HIV co-infection[5,11-12] . Several mechanisms have been postulated to explain why HBV may act as a cofactor for HIV disease progression. Non specific immune stimulation enhancing HIV replication, CD4 T-cell depletion reflecting infection of immune cells by HBV[3,7,11] These processes may be worsened if there are other risk factors such as alcohol consumption, drug or other medication abuse and metabolic syndromes[7]. HIV infection significantly modifies the nature history of HBV infection. Acute HBV infection in HIV infected patients is different from that observed in non HIV infected patients because of near absence of icteric illness, fulminant hepatitis and development of the chronic carrier state which ranges from 20-90 % of HIV infected patients as compared to less than 3% in non- HIV infected patients. Similarly, HIV related immune deficiency modifies the natural history of chronic HBV infection in many ways with higher levels which

promotes a high contagion rate and the detection of HBV DNA even in the presence of hepatitis Delta virus super infection, lower ALT levels and lower rate of spontaneous loss of HBeAg and/or HBsAg and seroconversion to anti HBe , anti Hbs, and the high rate of viral reactivation (30%) as well as the potential reappearance of HBsAg in patients who have lost detectable HBV viraemia[4,9]. The co-infection rate of 26% and 18.7% that was observed among the age group of 21-30 and 31-40 years respectively is very important. This is the age group where people are more sexually active. The high rate of co-infection may be due to high prevalence rate of HBV in the general population. HbsAg prevalence rate of 3.4% and 10.7% were previously reported at different periods in this centre[13,14] while a prevalence of 55.6% was reported among patients. Since both viruses share the same routes of transmission, HIV may cause reactivation or re-infection in those patients previously exposed to HBV.

CONCLUSION

The prevalence of HBV infection in HIV infected patients is high (70.3%) in this study. Since HIV infected patients with HBV co-infection respond less to HAART treatment when compared to patients without HBV co-infection, additional concern and care must be taken to minimize complications associated with the use of HAART.

It is further suggested that HIV positive subjects be tested for HBV as this will help in the choice of therapy in patients' management.

REFERENCES

1. Bumett RJ. Hepatitis B virus and Human immunodeficiency virus co-infection in Sub Saharan Africa; a call for further investigation. Liver international 2005; 25(2): 201 - 213.
2. Konopnicki D. (for the EuroSIDA Group) Hepatitis B and HIV: prevalence, AIDS progression, response to highly active antiretroviral therapy and increase motality in the EuroSIDA cohort. AIDS 2005 19(6): 593 - 601.
3. Otedo AEO. HBV, HIV co-infection at Kisumu District Hospital, Kenya. E. Afri Med J 2004; 81 (12): 626-30.
4. Vallet- Pichard A, Stanislas POI, Hepatitis viruses and HIV co-infection: pathogenesis and treatment. J. Hepatol 2004;1:1 - 7.
5. Akolo CO. impact of Hepatitis B Co-infection on the $CD4^+$ cell counts of HIV/AIDs patients on highly active antiretroviral therapy at the Jos University Teaching Hospital. 4th National Conference on HIV/ AIDS in Nigeria.Abuja. 2004.
6. Odama LE, Mohammed SB, Audu I.G, *et al.* Prevalence of Hepatitis C Virus Amongst HIV infected patients and Blood Donors in Nigeria. 4th National Conference HIV / AIDS in Nigeria,Abuja. 2004.
7. Nunez M. Selected highlights from the 1st International workshop on HIV and Hepatitis co-infection. Amsterdam, The Netherlands. December 2004.
8. Santiago-Munoz P. Prevalence of hepatitis B and C in pregnant women who are infected with human immunodeficiency virus. Am J Obstet Gynaecol 2005;193(3 suppl):1270 -1273.
9. Randon A. The role of early monitory of RBV plasma levels during the course of anti- HCV treatment.1st International workshop on HIV and Hepatitis co infection , Amsterdam, The Netherlands. December 2004.
10. Bonacini M. Hepatocellular carcinoma in HIV infected patients.1st International workshop on HIV and Hepatitis co-infection. Amsterdam, Netherlands. December 2004.
11. Nunez M, Sariano V . Management of patient co-infection with Hepatitis B virus and HIV. Lancet infectous Diseases 2005; 5(5):374- 382.
12. Aghanashinikar PN, Al-Dhahry SH, Al-Marbuby HA, Buhi MR, Daar AS, Al Hasani MK. Prevalence of hepatitis B, hepatitis delta and human immunodeficiency virus infections in Omani patients with renal Diseases. Transplant Proc. 1992; 24(5):1913 - 1914.
13. Takalmawa HU, Emokpae MA, Abubakar AG, Kwaru AH. Prevalence of hepatitis B surface antigen and Human immunodeficiency virus antibodies among blood donors in Aminu Kano Teaching Hospital Kano, Nigeria.1996-2001. Hamdard Med 2004; 47(2):54 - 57.
14. Adomeh DJ. Prevalence of hepatitis B surface antigen among the population /patients attending the General hospital Potiskum,Yobe State, Nigeria. Journal of life and Environmental Sciences 1999;1(2):77- 81.