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Prevalence of Hepatitis B Surface Antigen Among HIV Positive Clients Attending Dalhatu Araf Specialist Hospital Lafia, Nasarawa State, Nigeria

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Abstract

Viral Hepatitis is an inflammation of the liver, caused by a number of etiological agents especially the hepatitis B virus. The study is aimed at investigating the prevalence of Hepatitis B surface antigen among HIV/AIDs clients attending Dalhatu Araf Specialist Hospital Lafia. Exactly 2ml of whole blood sample was collected from 500 HIV positive clients attending Dalhatu Araf Specialist Hospital Lafia. On the spot testing for HBSAg was conducted using commercially prepared Hepatitis B surface antigen test strips. Out of the 500 clients tested, 11.8% were co-infected. Females had the highest co-infection rate of 62.7%; p=1.000, clients within the age range of 25-29 and illiterates also had the highest co-infection rate of 30.5%; p=0.632 and 55.9%; p=1.00 respectively. Screening of all HIV clients for HBsAg should be encouraged by the hospitals to enable prompt detection of HBsAg/HIV co-infection and adequate management.

Keywords: Hepatitis B, Surface antigen, Co-infection, Etiological agents and Liver.

Introduction

Hepatitis B is an infection of the liver caused by the hepatitis B virus. The infection can be acute or chronic [1]. The chronic hepatitis B virus (HBV) infections among patients with Human Immunodeficiency Virus (HIV) worldwide were reported to be 8.4% [2]. HIV/ HBV confections increase the progression of HBV to liver cirrhosis or end stage liver disease [3]. Hepatitis B can cause a chronic infection and put people at high risk of death from liver cirrhosis and cancer [3]. Hepatitis B is a major global health problem. The burden of infection in the WHO Western Pacific Region affects 116 million people while the WHO African Region is lower with 81 million people chronically infected [1]. In the WHO Eastern Mediterranean Region, sixty million people are infected, 18 million in the WHO South-East Asia Region, 14 million in the WHO European Region and 5 million in the WHO Region of the Americas [1]. More than 350 million people in the world today are estimated to be persistently infected with hepatitis B virus [4]. Large fraction of these is in Eastern Asia and Sub - Sahara Africa, where the associated complication of chronic liver disease and liver cancer are the most common health problems [4]. Lok & Mcmahon, [5], also reported that ten percent of people living with hepatitis worldwide also live with HIV. Hepatitis is characterized by changing the appearance of the normal hepatitis lobular design due to varying degrees of necrosis of an individual's liver cells or group of liver cells. Acute, (co-infection) or chronic (super inflation) inflammation of kuffer cells enlargement and proliferation (super infection). There is usually some degree of disruption of normal bile flow which causes, jaundice. The severity of the disease is highly variable often unpredicted [6].

Although hepatitis had been recognized for centuries, yet physicians had no idea of the cause until 1940 – 1977, when they suspected that the virus found in human blood is responsible; this caused a major public health problem in all parts of the world. There are six (6) known hepatitis viruses which are labeled as A, B, C, D, E and G [7]. In Nigeria high HIV-1 sero prevalence rate at 5.0% and high HBV carriage rate of 10.3% in general population have created opportunities for co-infection with HIV and HBV. This is possible because HIV and HBV have the same mode of transmission. The prevalence of HBV in HIV infected individual's ranges from 20% to 42% in Nigeria [8]. There

is great virological, epidemiological and clinical interaction between HIV and HBV i.e. people with HIV/HBV co-infection have a greater rate of chronic liver disease, high viral load of HBV and accelerated progression of liver disease [8].

Hepatitis B formally known as "Serum hepatitis" tends to be more severe than other hepatitis, causing mortality from liver failure in 1% to 10% of hospitalized cases [9]. Current medical diagnostic practice identifies three distinct Antigen-Antibody systems that relate to HBV infection and circulating markers that are useful in diagnosis which are: -

Surface Antigen (HBSAg), Core Antigen (HBCAg) and Enveloped Antigen (HBEAg). The appearance of HBSAg (anti-HBs) is the first evidence of infection appearing before biochemical evidence of liver disease which persists throughout the clinical illness. Persistence of HBS Ag more than six months after the acute illness signifies chronic hepatitis B [7]. HBCAg: Represent outer covering of the micleo capsid and the presence of antibody to HBCAg indicates acute rather than chronic hepatitis.

HBEAg: The presence of envelop antigen in blood indicate a strong likely hood that the blood is infected with hepatitis virus [9]. Since there is "no cure" for Hepatitis B and HIV for now, there is need for quick identification of co-infected patients so they could be managed in such a way that progression in liver damage could be slowed down as much as possible [3]. Therefore, using a representative sample size, we set out to determine the prevalence of this co-infection and evaluate its association with age and gender in Dalhatu Araf Specialist Hospital Lafia.

In most centers where patients are assessing ART, testing HIV positive clients for Hepatitis have not been made a policy, many HIV clients on ARV are silent carriers of hepatitis B virus that constitutes a reservoir for further transmission to others and it also increases the frequency of opportunistic infections [9]. Therefore, prompt identification and management of co-infected clients will help in improving the quality of care that will be given to HIV patients on ART.

The study is aimed at investigating the prevalence of Hepatitis B surface antigen among HIV/AIDs clients attending Special Treatment Center (STC) in Dalhatu Araf Specialist Hospital Lafia.

Materials and Methods

The study area

The research was carried out in the Special Treatment Centre (STC) of Dalhatu Araf specialist Hospital Lafia. Lafia is the capital of Nasarawa State. It is a town in the Southern Senatorial District of Nasarawa State. Nasarawa is a state in the North-Central Geopolitical Region of Nigeria with a population of about 1,863275 according to 2006 census. It is bounded in the north by Kaduna, in the west by FCT, in the south by Kogi and Benue States and in the east by Taraba and Plateau States. Lafia town has a population of about 330,712 inhabitants [10, 11].

Ethical approval

An ethical clearance was obtained from the Research Ethical Committee of Dalhatu Araf Specialist Hospital Lafia and informed consent of each participant obtained.

Sample size determination

The sample size was determined using the formula below:

$$n = \frac{Z^2 \ \delta^2}{E^2}$$

Where; n = minimum sample size, Z = confidence level at 95% = 1.96, δ = Standard deviation = 0.5,

E = Margin Error = 0.05

$$\therefore n = \frac{(1.96)^2 \times (0.5)^2}{(0.05)^2} = \frac{(3.842)\ (0.25)}{0.0025}$$

$$\frac{0.9605}{0.0025} = 384$$

This is the minimum sample size that can give 95% confidence for accurate result. Hence, we used 500.

Sample collection and assay

Two milliliters (2ml) of whole blood sample were collected from 500 HIV positive patients attending STC at Dalhatu Araf Specialist Hospital Lafia within the period of study. Commercially prepared Hepatitis B surface antigen test strips were purchased from Abon Laboratory, the expiration date; storage conditions and packaging method were also observed. On the spot testing for HBSAg was conducted using the test strips according to manufacturer's instructions [1].

Statistical analysis

Data obtained was subjected to statistical analysis using SPSS. Chi-square was calculated at 95% confidence level where P value <0.05. This data was further presented in a tabular form using three variables which are age, sex and educational background.

Results and Discussion

The data generated from this study were subjected to statistical analysis using chi square test and presented in tabular forms. Variables such as age, sex and educational

qualification were used to determine the level of prevalence as shown in table 1 to 4.

Table 1: Shows the frequency of HIV/HBsAg co-infected clients and those clients that were examined but found not to be co-infected. Table 2: Shows the percentage prevalence of Hepatitis B/HIV co-infection according to sex. Out of the 22 males screened, the percentage prevalence was 37.3% while the 37 co-infected females screened had the percentage prevalence of 62.7% Table 3: Shows the percentage prevalence of HIV/HBsAg according to age. The clients within the ages 25 to 29 were mostly affected with the percentage prevalence of 30.5%. Followed by respondents within the ages 30 – 34 with percentage prevalence of 18.6%. Table 4: Shows variation in percentage prevalence of HIV/Hepatitis B surface antigen co-infection in relation to the educational qualification of the respondents. Those clients that are not educated had the percentage prevalence of 55.9% while those clients that are educated had the percentage prevalence of 3.4% and 40.7% for secondary and tertiary schools respectively.

Table 1: Frequency of HIV/HBsAg Co-infected Clients

Variable	Frequency of clients	Percentage (%)
Number infected	59	11.8
Number not infected	441	88.2
Total	500	100

Table 2: HBsAg/HIV Co-infection in Relation to Sex of Clients Examined

Variable	Frequency of clients	Percentage (%)
Male	22	37.3
Female	37	62.7
Total	59	100
$\chi^2 = 0.000$	df = 1	p = 1.000

Table 3: HBsAG/HIV Co-infection in Relation to Age of Clients Examined

Age range of clients	Frequency of co-infected clients	Percentage (%)
5 – 9	- -	- -
10 – 14	- -	- -
15 – 19	1	1.6
20 – 24	8	13.6
25 – 29	18	30.5
30 – 34	11	18.6
35 – 39	9	15.3
40 – 44	8	13.6
45 – 49	2	3.4
50 – 54	2	3.4
55 – 59	- -	- -
60 – 64	- -	- -
Total	59	100
$\chi^2 = 4.333$	df = 6	P = 0.632

Table 4: HBsAg/HIV Co-infection with Respect to Educational Qualification of Clients Examined

Educational qualification	Number Co-infected	Percentage (%)
Primary	0	-
Secondary	2	3.4
Tertiary	24	40.7
Illiterates	33	55.9

Total	59		100
χ^2= 0.000	df = 3	P = 1.000	

From the study, the results obtained showed a percentage prevalence of Hepatitis B virus among patients on ART attending Special Treatment Centre in Dalhatu Araf specialist Hospital Lafia to be 11.8%. This is in agreement with the report of [5], where he reported percentage prevalence of 10% of over 350 million HIV positive people living with Hepatitis B worldwide.

The findings of this work contradict the report of [13] which stated an overall prevalence of 2.23% in Ekiti State, Southwest Nigeria. HIV/HBV co-infection rate were higher among men who have sex with men (MSM) and drug users with percentage prevalence of 20-30%.

In this study higher prevalence seen in females 62.7% as against males 37.3% could be associated to the fact that women attend clinic more than men so there could be some Healthcare Associated Infection (HAIs). Women indulge in activities that are risky such as household job, ear piercing, tattooing, acupuncture, and other parental care that involve contact with blood products [12]. The prevalence rate with regards to age shows that clients within the ages of 25-29 had the highest percentage prevalence of 30.5% followed by those within the ages of 30-34 with prevalence rate of 18.6% this shows that clients within those age brackets are very active sexually and are mostly involved in the use of hard drugs. This could be responsible for the high rate of HIV/HBsAg co-infection. For the prevalence rate based on educational qualification those in secondary school had percentage prevalence of 3.4% while those in tertiary education had a percentage prevalence of 40.7%. There was no significant difference between clients educational status and HBsAg/HIV co-infection (p=1.000). This does not agree with the findings of [14] where a significant difference was recorded among patients in Anyigba, Kogi State, Nigeria (p=0.004). This disparity may be due to different educational background and exposure of clients.

Conclusion

HIV/Hepatitis B co-infection was found to be common among HIV positive clients because of suppression of immune response by the HIV which consequently affect natural clearance of Hepatitis B virus from the liver which leads to development of liver disease and an increase in mortality in co-infected clients. Therefore, all HIV positive clients assessing treatment should be promptly screened for Hepatitis B virus at enrolment. Positive cases treated to reduce the possibility of liver damage leading to death and negative cases vaccinated to prevent the infection.

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