EXCELLENT PUBLISHERS

International Journal of Current Research in Biosciences and Plant Biology

ISSN: 2349-8080 Volume 2 Number 4 (April-2015) pp. 50-53

www.ijcrbp.com

Original Research Article

Fibrinogen Concentrations among HIV Positive Patients in Federal Medical Centre, Owerri, Nigeria

Emmanuel I. Obeagu[1]* and Getrude U. Obeagu[2]

[1]Diagnostic Laboratory Unit, University Health Services, Michael Okpara University of Agriculture, Umudike, Abai State, Nigeria
[2]Department of Nursing Science, Ebonyi State University, Abakaliki, Nigeria

**Corresponding author.*

Abstract

The values of fibrinogen were found out in HIV positive patients in Federal Medical Centre, Owerri, Nigeria. One hundred and sixty four subjects were sampled, comprising one hundred and fourteen HIV positive subjects and fifty HIV negative subjects which served as the control. Fibrinogen was analyzed using standard techniques. Whereas, there were no significant changes (p>0.05) in fibrinogen concentration between the HIV Positive subjects and the HIV negative subjects.

Keywords

Fibrinogen
HIV
Retrovirus

Introduction

Human Immunodeficiency Virus (HIV) is a lentivirus (a member of the retrovirus family) that causes acquired Immunodeficiency Syndrome (AIDS) (Weiss, 1993). This is a condition in humans in which progressive failure of the immune system allows life threatening opportunistic infection and cancers to thrive. Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate or breast milk of the infected person to HIV free person. Within these body fluids, HIV is present as both free virus particles and virus within infected immune cells. The four major routes of transmission are unsafe sex, contaminated needles, breast milk, and transmission from an infected mother to her baby at birth (perinatal transmission) (Fox et al., 1992).

Viruses such as HIV cannot grow or reproduce on their own, the need to infect the cells of a living organism in order to replicate. The human immune system usually detects and kills viruses fairly quickly, but HIV attacks the immune system itself, the very thing that would normally get rid of the virus (Ascher et al., 1990). HIV is a causative organism of autoimmune deficiency syndrome which was recognized as a new disease syndrome in the early 1980's in the USA with the unusual occurrence of

pnemocystiscarinii pneumonia and Kaposi's sarcoma in previously healthy young men (Greene, 1991). This retrovirus was isolated from a young homosexual man with lymphadenopathy. The virus was identified and classified in the family Retroviridae genus lentviranae (Baker et al., 2007).

Under the electron microscope, the viruses were revealed as a cylindrical core with nucleic acid cloned and sequenced. The cylindrical core is 80-130nm in diameter, it has a unique three layered structure, and innermost is the genome nucleocapside complex. This complex is enclosed within a capsid which is surrounded by a host cell membrane derived envelope, from which viral envelope glycoprotein 'spikes' project. HIV infects a wide variety of tissues in humans including the marrow, lymph node, brain, skin and bowel (Baker et al., 2007). This retrovirus differs from other retroviruses such as human T lymphotrophic virus (HTLV) 1 and 2. The virus was eventually named Human Immunodeficiency Virus (Cohanet al., 1986).

It is transmitted mostly sexually in blood or blood products and pre-natally. The most at risk of acquiring HIV infection are homosexuals, injecting drug misusers and those with bisexual orientation. Others include individuals receiving unscreened blood or blood products, infants born of infected women. There are various strains of HIV and are designated by a code with geographically informative letters and sequential numbers placed either in brackets, or as a number, or as a subscript. Examples are HIV-$_{sf33}$ and HIV -2 (Pantaleo et al., 1995). If there is a laboratory evidence of HIV infection, certain indicator diseases that require presumptive and definitive diagnosis are diagnostic of AIDS, AIDS is an illness characterized by one or more indicator diseases (Safrit et al., 1995).

Acute HIV is usually characterized by fever, malaise, lymphadenopathy and rash. These conditions are subclinical. A chronic infection of AIDS that follows is asymptomatic in early stages. If an individual is infected with this virus, the virus acts so quick destroying the immune system making the individual prone to little infections. HIV is present all over the world and the long term consequences of this pandemic will affect every country one way or another over time. This is an evolving pandemic threatening global public health and health care provision, as well as political and economic stability (Kuby, 1997).

In reference to the abnormality of coagulation in HIV positive individuals, the coagulation disorders will be investigated, by considering platelet count, prothrombin time, activated partial thromboplastin time, and blood fibrinogen concentration, as well as CD_4 count and factor VII concentration. Fibrinogen (factor 1) is a soluble plasma glycoprotein synthesized by the liver and is converted by thrombin into fibrin during blood coagulation. Fibrinogen deficiency (hypo-fibrinogenemia) or disturbed function of fibrinogen can lead to either bleeding or thromboembolic complications (Acharga and Dimichele, 2008).

CD4 count is the number of CD4 cells per microlitre of blood. It is used to stage the patient's disease, determine the risks of opportunistic illness, assess prognosis and guide decisions about when to start antiretroviral treatment (CDC, 2009). The aim of the present investigation was to determine the value of fibrinogen among HIV positive subjects in FMC, Owerri, Nigeria.

Materials and methods

The sample size for this study was calculated based on Ijeoma et al. (2010) 8.1% prevalence of HIV in Owerri in 2010.

$$n = \frac{1.96^2 \times 0.08(1.00-0.08)}{(0.08)^2} = 114 \text{ samples.}$$

Participant information sheet (PIS) was given to the prospective participants. After reading and understanding the PIS, questions were asked and proper explanations given. They consented to participate in the study by signing the informed consent form. The informed consented subjects (both

HIV/AIDS positive patients and HIV negative controls were considered as eligible. One hundred and fourteen HIV positive subjects aged 18-65 years attending Heart to Heart clinic of Federal Medical Centre, Owerri, Nigeria were screened. Fifty HIV negative subjects were also screened and they served as controls.

Informed consented subjects were sampled. Blood was collected from all the subjects, 4.5mls of which was added into trisodium citrate container containing 0.5mls of trisodium citrate for coagulation study (Fibrinogen concentrate assay). The sample was spun at 3000rpm for 10 min, and then the clear plasma was collected into a clean dry plastic container. The test was performed using Rayto semi auto coagulation analyzer, RT-2204C model manufactured by Rayto Life and Analytical Sciences Co. Ltd.

The fibrinogen was assayed using the method of Clauss (1957). The sample was diluted with 450µl of imidazole buffer to 50µl of sample to give a 1:10 dilution. 200µl of pre-diluted sample was added to the test cuvette, the sample was incubated for 5 min at 37°C. Then 100µl of bovine thrombin is added. The time of clot was recorded in seconds, while the concentration was recorded in mg/dl.

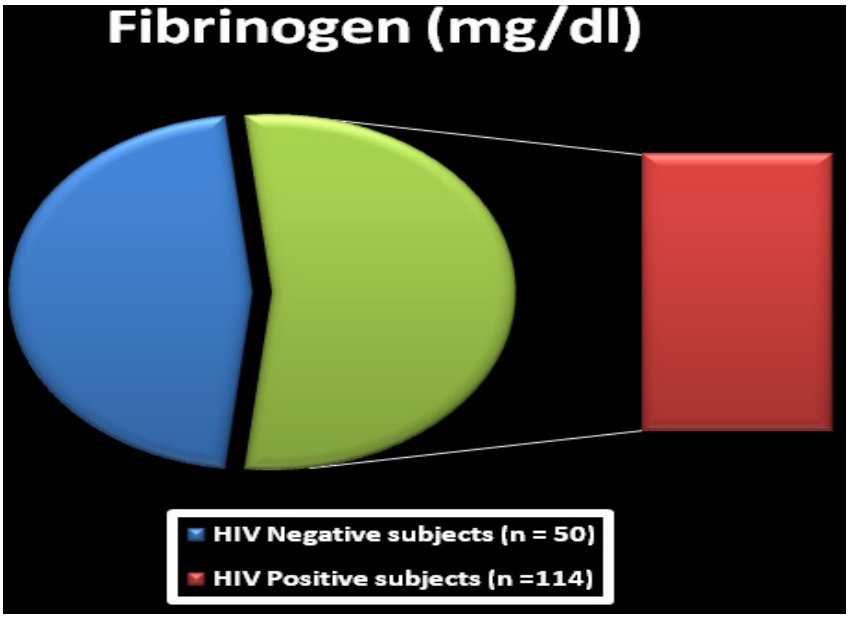
Statistical analysis

The data obtained were subjected to some statistical analysis such as the mean (X), standard deviation (SD), standard error of mean (SEM), student's t-test and Pearson moment of correlation using statistical package for social sciences (SPSS) version 17. The results were expressed in mean ± standard error of mean.

Results and discussion

The mean value of fibrinogen among the study subjects are shown in Fig. 1 below. Fibrinogen concentration showed no significant difference among HIV positive subjects (p>0.05) when compared to the HIV negative subjects (control). HIV infection is associated with endothelial dysfunction and liver damage. Both endothelial dysfunction and liver damage can result in coagulation defects. It is therefore expected that as the HIV infection progresses, the coagulation abnormalities will increase (Linder et al., 1990).

Fig. 1: Fibrinogen content among the study group comprising HIV positive and negative subjects.



Fibrinogen deficiency (hypo-fibrinogenemia) or disturbed function of fibrinogen can lead to either bleeding or thromboembolic complications (Acharga and Dimichele, 2008). CD4 count is the number of CD4 cells per microlitre of blood. It is used to stage the patient's disease, determine the risks of opportunistic illness, assess prognosis and guide decisions about when to start antiretroviral treatment (CDC, 2009). The fibrinogen concentration and factor VIII concentration in HIV patients showed no significant difference when compared to the HIV seronegative controls (p>0.05). This could be because, some of the HIV positive subjects were on anti-retroviral drugs or as a result of the method employed.

References

Acharga, S., Dimichele, D.M., 2008. Rare inherited disorders of fibrinogen. Haemophil. 14(6), 1151-1158.

Ascher, M. S., Sheppard, H.W., 1990.AIDS as immune system activation. J. Acq. Imm. Deficien. Synd. 3, 177.

Baker, F.J., Silverton, R.E., Pallister, C.J., 2007. Haemaostasis. In: Introduction to Medical Laboratory Technology. 7th EdN., Honeyland Resources limited. 387p.

Centre for Disease Control and Prevention (CDC), 2009. Guidelines for prevention and treatment of opportunistic infections in HIV-1 infected adults and adolescents: Recommendations from CDC, the national institutes of Health and the HIV medicine association of the infectious diseases society of America.

Clauss, A., 1957. Rapid physiological coagulation method in determination of fibrinogen. Acta Haematol. 17, 237-246.

Fox, C.H., Cottler-Fox, M., 1992.The pathology of HIV infection. Immunol.Today 13, 353.

Greene, W.C., 1991. The molecular biology of human immune deficiency virus type 1 infection. New Engl. J. Med. 324, 308.

Ijeoma, B.C., Kalu, I.G., Nwachukwu, C.U., Nwachukwu, I.G., 2010. Incidence cases of HIV/AIDS infection in Owerri West local Government area of Imo State, Nigeria. J. Biol. Sci. 5(4), 304-309.

Kuby, J., 1997. The Immune System in AIDS. In: Immunology. 3rd Edn. Freeman and Company. pp. 523-541.

Linder, M., Muller-Berghaus, G., Lasch, H.G., 1970. Virus infection and blood coagulation. Thromb. Diath. Haemorrh.120, 129-152.

Pantaleo, G., Fauci, M. S., 1995. New concepts in the immunopathogenesis of HIV infection. Ann. Rev. Immunol. 13, 487.

Safrit, J.T., Koup, R.A., 1995. The immunology of primary HIV infection: which immune responses control HIV replication? Curr. Opin. Immunol. 7, 456.

Shapiro, S.S., 2003. Treating thrombosis in the 21st century. New Eng. J. Med. 349(18), 1762-1764.

Weiss, R.A., 1993. How does HIV cause AIDS. Nat. 460(7256), 711-716.