EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 1
Issue: 2
502-508
Year: 2014

SOME HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS AMONG ART AND NON-ART HIV POSITIVE PATIENTS IN LIVING WORD MISSION HOSPITAL, ABAYI, ABA, ABIA STATE, NIGERIA.

Obeagu Emmanuel Ifeanyi[1*], Dr.Okoroiwu Ijeoma Leticia[2], Okoro Nnenna Kalu[3], Agbo Ejiofor Christopher[4]

[1]Diagnostic Laboratory Unit, University Health Services Department, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.
[2]Dr.(P.hD),Lecturer,Department of Medical Laboratory Science,Faculty of Health Sciences,Imo State University,Owerri,Nigeria.
[3]Laboratory Department,Living Word Mission Hospital, 5-7 Abayi Road, Aba, Abia State, Nigeria.
[4]Department of Medical Laboratory Services, Federal Medical Centre,Umuahia, Abia State, Nigeria.

Article Received on 25/08/2014 **Article Revised on 17/09/2014** **Article Accepted on 09/10/2014**

***Correspondence for Author**
Dr. Obeagu Emmanuel Ifeanyi
Diagnostic Laboratory Unit, University Health Services, Department, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

ABSTARCT

The study was carried out in Living Word Mission Hospital,Abayi,Aba,Abia State,Nigeria.The study was carried out among the ART and non-ART HIV patients attending the hospital.Some haematological and biochemical parameters values were compared among the ART and the non-ART HIV patients to ascertain if there is any significant change among those on treatment and those not receiving treatment.The total number of subjects for the study was 97(female=68, male=29).77 subjects were ART HIV patients(female=55,male=22) while 20 subjects were non-ART HIV patients(female=14,male=6). The result showed significant increase in Hb ($P<0.05$) between the HIV positive patients on ART compared to non- ART patients. There was no significant change ($P>0.05$) in mean value ,of PCV,RBC,MCV ,MCHC. The result equally showed significant increase ($P<0.05$) in the mean values of creatinine of the HIV patient on ART compared to those on non ART . There was no significant change ($p>0.05$) in K^+ ,but significant increase ($p<0.05$) in mean values of GOT of those non ART patients compared to

ART patients and significant increase ($p<0.05$) in the mean values of GPT of ART patients compared to the non ART patients.

KEYWORDS: Some haematological parameters,some biochemical parameters, AntiretroviralTherapy(ART),Non-Antiretroviral Therapy(Non-ART).

INTRODUCTION

HIV is a multisystemic infection that suppresses haematopoietic system[18]. HIV/AIDS is a global pandemic disease [1]. As of 2012,approximately 35.3 million people have HIV worldwide with the number of new infections that year being about 2.3 million [2].

Sub-Sahara Africa is the region mostly affected.In 2010,an estimated 68% of all HIV cases and 66% of all deaths(1.2 million) occured in this region[3].Here in contrast to other regions women compose nearly 60% of cases[3].South Africa has the largest population of people with HIV of any country in the world at 5.9 million as opined by UNAIDS[3] as contained in Obeagu et al.[18].Life expectancy has fallen in the worst affected countries due to HIV/AIDS; for example in 2006 it was estimated that it had dropped from 65 to 35 years in Bostwana[5].Mother-to-Child trnsmission, as of 2013, in Bostwana and South Africa has decreased to less than 5% with improvement in many other Africa nations due to improved access to antiretroviral therapy [2].South and South East Asia is the second most affected in 2010. This region contained an estimated 4 million cases or 12% of all people living with HIV, resulting in approximately 250,000 deaths [3].

Human Immunodeficiency Virus(HIV) is a retrovirus that causes Acuired Immunodeficiency Syndrome(AIDS)[14,15] a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive.Infection with HIV occurs by the transfer of blood,semen,vaginal fluid.

HIV can infect a variety of immune cells such as CD4 Tcells,macrophages and microglial cells.HIV-1 entry to macrophages and CD4 T cell is mediated through interaction of the virion envelope glycoprotein(gp120) with the CD4 molecule on the target cells and also with chemokine coreceptors[16]. Macrophage(M-tropic) strains of HIV-1,or non-syncitial-inducing strains(NSI) use the B-chemokine receptors CCR5 for entry and are,thus,able to replicate in macrophages and CD4 T cells[17]. Indeed,macrophages play a key role in several critical

aspects of HIV infection.They appear to be the first cells infected by HIV and perhaps the source of HIV production when CD4 T cells become depleted in the patient.

Although,numerous complications occur in HIV- infected patients[7,9,11]. The most common haematological abnormalities are anaemia and neutropenia[9].Anaemia and neutropenia are generally caused by inadequate blood production because of bone marrow suppression by HIV infection mediated by abnormal cytokine expression and alteration of the bone marrow microenvironment[10,9]. Anaemia in HIV-infected persons is associated with CD4 Tcells depletion and progression to AIDS[12] and is one of the strongest predictors of HIV mortality and poor responses to antiretroviral therapy(ART)[7]. Neutropenia is frequently observed in advanced stages in HIV infection after development of AIDS,and has beeen associated with certain types of antiretroviral medications used to treat HIV infection.Thrombocytopenia frequently occurs in HIV-infected patients[9,10,11]. Haematological parameters mainly anaemia and leucopenia in HIV-infected ART-naive patients result in poor ART- treatment outcome and otherwise strongly predict mortality [21,7,13].

It is observed that the emergence of drug development programme by government agencies, research establishments and pharmaceutical industries has led to many potent anti-HIV drugs called antiretrovirals[22]. Presently,a combination of these drugs known as highly active antiretroviral therapy (HAART) is recommended as a standard medication for the management of HIV infection. The advent of HAART,a cocktail of a nucleoside and non-nucleoside analogues with potential to inhibit HIV reverse transcriptase and protease[23] has lead to a reduced progression of the HIV infection to AIDS.This however,results in improved quality of life of people with HIV/AIDS.

It is highly documented that the haematological consequences of HIV infection is dominated by peripheral blood cytopenia.This has become more common with the advent of antiretroviral therapy and related treatments for HIV-associated infections and malignancies[24,25]. Generally,in patients undergoing ART,anaemia may occur in approximately 60-70%,neutropenia in 50% and thrombocytopenia in 40%.[26]

Antiretroviral drugs (ARVDS) are medications for the treatment of infection by retroviruses primarily HIV.Different stages of HIV cycle [19]. Combination of severally (typically three or four) ARVDS are known as highly Active Anti-retroviral Therapy (HAART).These ARVDS must be taken in combination in order to have a lasting effect.

MATERIAL AND METHODS

Study Area: The sudy was done in Living Word Mission Hospital, Abayi,Aba,Abia State,Nigeria.

Subjects: 97 HIV subjects were used for the study (female=68,male=29) who attended Living Word Mission Hospital Abayi, Aba,Abia State.77 subjects were on ART(female=55,male=22) and 20 subjects were non-ART HIV patients (female=14,male=6).

Sample and methods: Venous blood samples were collected from the subjects into EDTA anticoagulated blood containers for haematological tests and the other placed in plain tubes for biochemical tests.

Statistical Analysis: The data were analysed with t-test and statistical significance set at $P<0.05$.

Ethics: Oral consents were made to the subjects prior to the sample collection.

RESULT

TABLE 1: SOME HEAMATOLOGICAL AND BIOCHEMICAL PARAMETERS AMONG NON-ART AND ART HIV POSITIVE PATIENTS

Parameters	Non-ART	ART	Level of Signicance
PCV(%)	34.8±2.3	33.5±4.3	p>0.05
RBC×10^{12}/L	3.6±1.2	4.8±1.5	p>0.05
Hb(g/dl)	9.5±1.0	11.3±0.8	P<0.05
MCV(fl)	90±4.4	89±5.0	p>0.05
MCH(pg)	30±3.1	30±4.2	p>0.05
MCHC(g/dl)	33.2±1.6	33.4±2.5	p>0.05
K(Mmol/L)	4.1±0.5	4.2±0.7	p>0.05
Craetinine(Mmol/L)	85.7±7.2	89.4±5.2	P<0.05
GOT(iu/l)	24±3.5	17.5±4.7	P<0.05
GPT(iu/l)	14.3±3.6	16.9±2.4	P<0.05

DISCUSSION

Advances in the development of antiretroviral therapy (ART)—medications used in combination to reduce the replication of HIV virus and treat HIV-infected persons. Because of these medications, many HIV-infected persons are able to reduce levels of virus in the bloodstream (plasma viral load) to undetectable levels. Data suggest that HIV-infected persons with undetectable viral load are less infectious, and may be less likely to transmit

HIV via sexual contact.When antiretroviral therapy is commensed early enough,it will improve the haematological and biochemical functions of the affected patients.

The result showed significant increase in Hb ($P<0.05$) between the HIV positive patients on ART compared to non- ART patients. The study supported the earlier findings of chukwura et al. and weiss et al. as contained in Amegor et al.[20] that the use of ARVDS thrapy increase PCV, Hb, WBC, and CD4 count and thus has the ability to boost the immune system of the body amidst the reported side effects.The ability of the drugs boosting the immune system seems to override the reported side effect and encourage the management of HIV/AIDS patient with ARVDS despite the side effects [20]. This shows that there is improvement when HIV positive patients are placed on ART more than those that are non ART.There was no significant change ($P>0.05$) in mean value ,of PCV,RBC,MCV ,MCHC. May be most of the HIV patients who were non ART in this study have recent infection showing that the virus has no siginficant impact on some of the hematological parameters studied.The result equally showed significant increase ($P<0.05$) in the mean values of creatinine of the HIV patient on ART compared to those on non ART .This may be that the drug has little impact on the kidney function of those receiving treatment.There was no significant change ($p>0.05$) in K^+ , but significant increase ($p<0.05$) in mean values of GOT of those non ART patients compared to ART patients and significant increase ($p<0.05$) in the mean values of GPT of ART patients compared to the non ART patients.This changes should be noted by the clinicians in course of the management of these patients about the bone marrow function, kidney and liver function to improve the well-being of those infected.

CONCLUSION

There is improvement on the HIV patients placed on ART more than those on non ART. More measures should be adopted by those involved with the management of these patients to ensure complianace by the patients. People should be encouraged for more voluntary conselling and testing to know there status early and their CD4 count noted early to determine when to start treatment.

REFERNCES

1. Cohen,M.S,Hellmann,N.,Levy,J.A,Decock,K.,andLange,J.(2008). The Spread, Treatment and Prevention of HIV-1 Evolution of a Global Pandemic.The Journal of Clinical Investigation, 118(4):1244-54.
2. UNAIDS(2013).Reports.

3. UNAIDS(2011).
4. Mandell,B. And Doland(2010). International Commitee on Taxonomy of Viruses.
5. Levy,J.A.(1993).HIV Pathogenesis and Long-term Survival.AIDS, 7(11):1401-10.
6. Centre for Disease Control (2009).
7. Anastos,K., Shi,Q., French,A., et al(2004).Total Lymphocytes Count,Haemoglobin and Delayed-type Hypersensitivity as Predictors of Death and AIDS Illness in HIV-1 Infected Women Receiving Highly Active Antiretroviral Therapy.J. Acquir Immune Defic. Syndr. 35: 383-92.
8. Obirikorang, C. And Yeboah,F.A.(2009).Blood Haemoglobin Measurements as a Predictive Indicator for the Progression Of HIV/AIDS in Resource-limited Setting.J.Biomed.Sc; 16:102.
9. Ajayi,A.O.,Ajayi,E.A., and Fasakin, K.A.(2009).$CD4^+$ T-Lymphocytes cell counts in Adults with Human Immunodeficiency Virus Infection at the Medical Department of a Tertiary Health Institution in Nigeria.Ann.Afr.Med.8: 257-60.
10. Aboulafia,D.M. and Mitsuyasu,R.T. (1991). Haematologic Abnormalities in AIDS.Hematol.Oncol.Clin. North. Am.15:195.
11. Coyle,T.E.(1997).Haematologic Complications of Human Immunodeficiency Virus Infection and the Acquired Immunodeficiency Syndrome.Med.Clin.North.Am.81:449-70.
12. Mata-Marin,J.A,Gaytan-Martinez,J.E. and Martinez-Martin,R.E.(2010).Risk Factors and Correlates for Anaemia in HIV Treatment-naive Infected Patients: a Cross-sectional Analytical Study.BMC.Res.Notes 3:230.
13. Rudnicka,D. And Schartwz,O. (2009). Intrusive HIV-1 Infected Cells. Nat. Immunol, 10:933-4.
14. Weiss, R.A. (1993). "How does HIV cause AIDS?". *Science* 260 (5112): 1273–9.
15. Douek, D.C., Roederer, M.,and Koup, R.A. (2009). "Emerging Concepts in the Immunopathogenesis of AIDS". *Annu. Rev. Med.* 60: 471–84.
16. Chan, D.C., Fass, D., Berger, J.M.,and Kim, P.S. (1997). "Core structure of gp41 from the HIV envelope glycoprotein". *Cell* 89 (2): 263–73.
17. Coakley, E., Petropoulos, C.J.,and Whitcomb, J.M. (2005). "Assessing ch vbgemokine co-receptor usage in HIV". *Current Opinion in Infectious Diseases* 18 (1): 9–15.
18. Obeagu,E.I.,Obarezi,T.N,Omeh,Y.N.,Okoro,N.K. and Eze,O.N.L,(2014).Assessement of Some Ha ematological and Biochemical Parameters in HIV Patients Before Receiving Treatment in Aba,Abia State,Nigeria.Research Journal of Pharmaceutical,Biological and Chemical Sciences 5(2):825-830.

19. WHO (2003).
20. Amegor, O.F, Bigila, D.A., Oyesola, O.A, Oyesola,T.o. and Buseni, S.T.(2009). Haematological Changes in HIV Patients Placed on Antiretroviral Therapy in Markudi,Benue State of Nigeria.Asian Journal of Epidemiology 2:97-103.
21. Munyazesa,E.,Emile,I.,Mutimura,E.,Hoover,D.R.,Shi,Q.,McGinn,A.P.,Musiime,S.,Muhairwe,F., Rutagenwa,A.,Dusingize,J.C., and Ananstos,K.(2012).Assessement of Haematological Parameters in HIV-infected and Uninfected Rwandan Women:a cross-sectional Study.B.M.J.2(6).
22. Pereira,C.F and Pardaen,T.T.(2004).Anti-HIV Drug Development-an Overview.Curr PharmDes 10(32):4005-4037.
23. Palella,F.I.,Delaney,K.M., Moorman,A.C., Loveless,M.O., Fuhrer,J., Satten,G.A, Ashman,D.J and Holmberg,S.D. (1998). Declining Morbidity and Mortality Among Patients with Advanced Human Immunodeficiency VirusInfection:HIV Outpatient Study Investigators.N.Engl J.Med 338(13)853-860.
24. Moh,R.,Danel,C.,Sorho,S.,Sauvaget,D.,Arzian,A.,Minga,A.,Gomi,O.B,Konga,C.,Inwoley A.,Gabillard, D.Bissagnes,E.,Salamon,R. and Anglaret,V.(2005).Haematological Changes in Adults Receiving a Zidovudine Containing HAARTRegimen in Combination with Cotrimoxazole in Cote d'Voire.Antivir Ther,10(5): 615-624.
25. Pluda,J.M.,Mitsuya,H.and Yarchoan,R.(1991).Haematologic Effects of AIDS Therapies.Haematol Oncol Clin North Am, 5: 229-248.
26. Scadden,D.T.,Zon,U.and Groopman,J.E.(1989)Pathophysiology and Management of HIV- associated Haematological Complication of HIV infection.AIDS Rev, 7(40): 187-196.