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CD4 CELLS PROFILE OF HAART NAIVE HIV SEROPOSITIVE CLIENTS IN KOGI STATE UNIVERSITY TEACHING HOSPITAL, ANYIGBA, KOGI STATE. NIGERIA

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ABSTRACT

CD4 lymphocyte cells are the primary targets of Human immune-deficiency virus (HIV). Enumeration of CD4 T lymphocytes in the peripheral blood is used in the assessment of disease clinical stage, risk of opportunistic infections, evaluation of prognosis and guide decision on the commencement of antiretroviral therapy. The objective was to determine CD4 cells profile of HIV sero-positive naïve patients in Kogi State University Teaching Hospital(KSUTH) Anyigba. A total of 404 HIV sero-positive Highly Active Anti Retro Viral Treatment (HAART) naïve patients comprising 147(36.4%) males and 257 (63.6%) females were examined. Approval was obtained from ethical committee of Kogi State University Teaching Hospital (KSUTH), Anyigba. Written and verbal informed consent was taken from all patients. The overall mean age of patients was 33.0 ± 12.7 years and female-male ratio was 1.7:1. Majority of patients were in the clinical stage two 121(30.5%) and three 200(50.4%). Patients had overall mean CD4 cells count of 381.8 ± 240.8 cells /mm^3. Patients CD4 cells count varied statistically with the HIV clinical staging (F =4.512 & P value=0.004) and statistically insignificant with gender (P value = 0.7562 & t Test= 0.3106) and tuberculosis status (P value=0.223 & F= 1.505).Conclusion: This study showed HIV sero-positive HAART naive patients presented in KSUTH with mean age of 33 years. Majority of patients presented in disease clinical stage two and three with a mean CD4 cells counts of 381.8 cells/mm^3 . This study recommend the need to reduce stigmatization, discrimination and promote early access to treatment , care and support services.

Keywords: HIV/AIDS, CD4, Patient/clients, KSUTH, Nigeria.

LA PREVALENCE DES STAPHYLOCOQUES AUREUS RESISTANTS A LA METHICILINE ET LES PRODUCTEURS DE B – LACTAMASE SPECTRE ETENDU PARMI LES BACTERIES ISOLEES DE PLAIES INFECTEES DANS UN HOPITAL TRETIAIRE A LA VILLE D'IBADAN

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TITRE COURANT: SARM ETBLSE BACTERIES PRODUCTRICES

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RESUME

La colonisation de la plaie par des microorganismes est le plus souvent poly microbiennes et l'incidence de haut niveau de la résistance par des isolats de plaies ont été rapportés. Staphylocoque aureus résistant à la Méthicilline (SARM) et bêta–Lactamases spectre étendu (BLSE) produisant des bactéries à Gram – négatif, les deux constituent un sérieux défi pour le médecin dans le choix du traitement antibiotique des infections causées par ces bactéries. Cette étude a déterminé les profils de sensibilité aux antibiotiques et la prévalence des producteurs de SARM et BLSE parmi les isolats bactériens des plaies d'un hôpital tertiaire dans la ville d'Ibadan. Quarante (40) isolats bactériens clinique provenant de cinq sources de plaies ont été recueillis de l'unité de

microbiologie de l'University College Hospital (UCH), Ibadan et ont été authentifiés avec des techniques bactériologiques standard. Test de sensibilité aux antibiotiques a fait par la méthode de diffusion sur disque en utilisant 19 antibiotiques appartiennent à 12 classes. Les souches SARM ont été détectés par la résistance aux antibiotiques cefoxitin et /ou oxacilline. La production de BLSE présomptif était par le test de synergie double dique en utilisant 30µg cefotaxime et ceftaxidime autour de 20/10 µg disques d'acide amoxicilline – clavunique. La confirmation de BLSE a été par la concentration minimale inhibitrice (CMI) en utilisant agar · méthode de dilution. Les isolats authentifiés comprennent Proteus spp (47,5%), Staphylococcus aureus (27,5%), Pseudomonas aeruginosa (12,5%), Klebsiella spp(7,5%), Acinetobacter baumannii (2,5%),et E. Coli (2,5%).
La distribution des isolats collectés selon des sources de plaies comprend: plaies aigües des tissus mous (35%), ulcère de jambe,(32%) les plaies chirurgicales (17,5%), les plaies de brule (12,5%)et les ulcères du pied diabétique (2,5%). La répartition selon le sexe des patients sont : male(65%), femelle (35%), selon les groupes d'âge sont :0 – 19 ans (22,5%),20 – 39ans (35%), 40 – 59 ans (32,5%) et ≥ 60 ans (10%). Tous (100%) les isolats étaient multiresistants (MDR) e t a n t resistant a ≥ 3 classes d'antibiotiques. Les pourcentage de la résistance des isolats à chaque antibiotique comprend: piperacilline, piperacilline · tozobactam et acide amoxicilline – clavulanique etaient 100%, ceftazidime, cefuroxime, cefixime, aztreonam, sulphamethoxazole – trimethoprim, erythromycin, chloramphenicol et doxycyline etaient >70%, cefoxitin (62,5%), nitrofurantoïne (52,5%), ciprofloxacine (45%), l'ofloxacine (35%),perfloxacin (37,5%), gentamicine (32,5%), et imipénème (2,5%). Du 11 Staphylocoque aereus recueillis, 54,5% ont été détectés comme des souches de SARM alors que la production de BLSE a été détectée dans 55,2% des isolats Gram négatif. Cette étude a révélé 100% phénotype constituant un niveau élevé des souches de SARM (54,5%) et les producteurs de BLSE (55,2%) chez les Gram – positif et Gram – négatif des isolats bactérien de plaies. Par conséquent, il faut la prudence dans l'utilisation des antibiotiques à spectre étendu dans le traitement des patients avec plaies infectées.

INTRODUCTION

Human immunodeficiency virus (HIV) is a virus belonging to retroviridae family and a member of the lent virus genus. HIV causes human immunodeficiency viral infection that could progress to acquired immune deficiency syndrome (AIDS) (1,2). According to World Health Organization in 2013 about 35 million people worldwide were living with HIV, while 2.1 million people had new infection and 12.9 million people had access to antiretroviral drugs. The AIDS related deaths globally occurred among 1.5 million people (3,4). In Nigeria, about 3.2 million people in 2013 were reported by United Nations Agency for International Development(UNAIDS) to be living with HIV, while 210,000 deaths occurred from AIDS related illnesses and 2 million orphans aged 0-17 years were estimated from AIDS (5). CD4 lymphocyte cells (also known and called T cells or T helper cells) are the primary targets of HIV (6). CD4 is a glycoprotein found on the surface of immune cells such as T helper cells, monocytes, macrophages and dendritic cells (7). CD4 T lymphocyte cells are white blood cells. They perform essential functions in the coordination of the immune response, the body defense reaction against microorganisms and some form of cancer. A CD4 count is a laboratory test that is measured directly by flow cytometry (8-11). The pathogenesis of HIV /AIDS is largely attributable to the decrease in T lymphocytes bearing the CD4 receptor. Progressive depletion of CD4+ T lymphocytes is associated with an increased likelihood of clinical complication including the development of AIDS.

The enumeration of $CD4^+$ T lymphocytes in the peripheral blood is an essential tool for the laboratory monitoring of HIV infected patients. Currently available $CD4^+$ T cells counting techniques are automated method using flow cytometry and the dedicated cytometers. Other techniques include manual assays using microscope or ELISA equipment (8-14). A CD4 T cells count measure the number of CD4 cells pre micro liter (ul) of blood in a sample (13-15). It is used in HIV infection to determine the clinical stage of the disease, assess the risk of opportunistic infections, evaluate prognosis and guide decisions on the commencement of anti retroviral therapy and drugs for opportunistic infections (16-19). In adults, absolute numbers of CD4 T cells are measured; while in infants and young children the relative CD4 cells among the total lymphocytes (CD4 percentage) is a more informative indicator of disease status. Determination of CD4 T lymphocyte count is affected by time of day, fatigue and stress (20-22). Other factors such as age, gender, race, socio economic, smoking, alcohol consumption, nutrition , infection and antiretroviral therapy have been identified as important determinants (20-22).

The objectives of the study was to determine the profile of CD4 T lymphocyte of HIV sero-positive clients that attended Kogi state University Teaching Hospital Kogi State university Teaching Hospital (KSUTH) Anyigba, Kogi state ,Nigeria between January 1, 2014 to December 31,2014.

MATERIALS AND METHODS

Materials used were Partec Cyflow Counter Cylometer, Partec Cleaning sheath and decontamination fluids. Other materials include

Partec CD4 and CD4% easy count kits, Rohrentubes, pipettes, tubes rack, EDTA tubes (5mls), Jik solution, Determine HIV Test kits with LOT number 59098k100 and Unigold HIV test kits with LOT number 3110061. The research design was a prospective experimental study. Ethical approval was obtained from the ethical committee of the Kogi state university teaching hospital, Anyigba, Kogi state, Nigeria.

Four hundred and four (404) clients who attended Kogi state university teaching hospital Anyigba between January 1, 2014 and December 31, 2014; and tested seropositive for Human Immunodeficiency Virus after screening with Determines and Ungold HIV test kits were examined. Verbal and written informed consent was obtained from all patients. History and examination was conducted on each patient to obtain biodata, weight, clinical staging and risk of pulmonary tuberculosis. Flow cytometry using Partec Cyflow Counter Flow Cylometer was used to determine CD4 T lymphocyte and CD4 percentage (23-25). 5mls whole blood sample was collected from each patient between 8.00 am to 10.00 am by venipuncture into 5ml vacutainer tubes containing EDTA. 20microliter of whole blood with EDTA as coagulant was added to a partec rohren tube. Addition 20 micro liter of Partec CD4 easy count kit was also added to the tube. The tube was incubated for 15 minutes at room temperature protected from light. 800 micro liter of no lyse Partec CD4 buffer was added(26). Slight shaking or vortex turning was done. Analysis of blood samples on the Cyflow Counter Cylometer was conducted after fixation of rohren tube on the sample pot. Statistical package for social sciences version 20 was used for data analysis. The study was predetermined at P value < 0.05 and 95% confidential interval. Data were generated into cross tabulations and descriptive statistics, T test and Analysis of Variance (ANOVA) were conducted.

RESULT

A total of 404 HIV seropositive naïve patients comprising 147 (36.4%) males and 257(63.6%) females were evaluated in this survey. The age distribution of patients was 140 (34.7%) in the 30-39 years, followed by 125 (30.9%) in the 20-29yrs, and 64 (15.8%) in the 40-49 years. The overall mean age of patients was 33.0 ± 12.7 years. The mean age of female patient was 31.7± 10.9 years, while that of the males was 35.1 ± 15.0 years. Patients' main ethnicity was Igala 382(94.6%), which was followed by Ibo 17 (4.2%) and other tribes. Patients belonged predominantly to HIV clinical stage three 200 (50.4%) and stage two 121 (30.5%) and were not tuberculosis suspect 367 (90.8%). The overall mean CD4 count of patients was 381.8± 240.8 cells/mm^3.The mean CD4 count of female patients was 384.4 ± 245. O cells /mm^3, while that of male respondents was 377.2 ± 181.9 cells /mm^3. Patients' CD4 cells count varied statistically with the HIV clinical staging (F=4.512 and P value =0.004) and statistically insignificant with gender (P value=0.7562, T test= 0.3106) and tuberculosis status (P value = 0.223 and F = 1.505).

TABLE 1: DISTRIBUTION OF RESPONDENTS BY DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

A. Age Distribution of Respondents:

Age (yrs)	*Frequency (%)*
0-9	*22(5.4)*
10-19	*13(3.2)*
20.29	*125(30.9)*
30-39	*140(34.7)*
40-49	*64(15.8)*
50-59	*28(6.9)*
>60	*12(3.0)*
Total	*404(100.0)*

B. Gender Distribution of Respondents:

Gender	*Frequency (%)*
Male	*147(36.4)*
Female	*257(63.6)*
Total	*404(100.0)*

C. Distribution of Respondents by ethnicity:

Ethnicity	*Frequency (%)*
Igala	*382(94.6)*
Yoruba	*2(0.5*
Ibo	*17(4.2)*
Hausa	*1(0.2)*
Other	*2(0.5*
Total	*404(100.0)*

D. Distribution of Respondents by HIV clinic Disease staging :

Clinic Stage	*Frequency (%)*
1	*72(18.1*

	2	*121(30.9)*
	3	*200(50.4)*
	4	*11(2.7)*
	Total	*404(100.0)*
E.	*Distribution of Respondents by HIV clinical disease stage::*	
	Tuberculosis(TB) status	*Frequency (%)*
	TB Negative	*367 (90.8)*
	TB suspect	*36(8.9)*
	TB exposed on INH Prophylaxis	*1(0.3)*
	Total	*404(100.0)*

DISCUSSION

The mean age distribution of HIV sero-positive naïve patients in this study lied in the third decade of life. The mean age group distributed in the very active reproductive life, characterized by risky behavior such as unprotected sex, multiple sexual partners, alcoholism, smoking, intravenous drug addiction and body tattoo practices which predisposes to HIV infection. The finding of this survey on the age group distribution of HIV sero-positive HAART naive patients were collaborated by several researchers (27-31). The age group above 60 years like in other studies recorded least patients which can be attributed to interplay of non sexual risky behavior in that age group category (28,29). The female male ratio recorded in this study was 1.7:1.

TABLE 2: STATISTICAL SUMMARY

Mean CD4 count	**=**	**381.800**
Standard deviation	**=**	**240.8**
Standard Error of the mean	**=**	**11.980**
Total Respondents(N)		**404**
T test of one sample	**=**	**31.8691**
Degree of freedom	**=**	**403**
P value	**=**	**0.0001**

Observations of higher distribution of HIV among female patients were collaborated by Omoti and Akinbami etal in their previous studied (32-33). Several reasons such as early marriage, polygamous relationship, occurrence of pelvic inflammatory diseases and genital ulcers were deduced by many researchers for the higher occurrence of HIV seropositive clients among female gender(34-36). Variant gender findings with predominant male distribution was recorded by Oguejiofor and Glynn et al in their separate studied (37-38). However, equal male-female ratio was observed by Nwozor and Nwankwo in Akwa, South East, Nigeria (29). This study showed that majority of patients belonged to Igala tribe, which is the main ethnicity of the people in the community where the health facility is located. Most patients presented in the health facility in the disease clinical stage two and three. low awareness, rejection, fear of stigmatization, cultural belief and tradio-medical patronage were among many reasons deduced for the late presentation and access of HIV treatment care and support programmes available in health facilities.

TABLE 3: DISTRIBUTION OF CD4 COUNT OF PATIENTS BY HIV/AIDS CLINICAL STAGE

CLINICAL STAGE	NUMBER OF SUBJECT	MEAN	SD	TOTAL DF	F	P VALUE
1	**72**	**464.6**	**258.0**	**403**	**4.512**	**0.004**
2	**121**	**390.9**	**219.7**			
3	**200**	**346.0**	**238.5**			
4	**11**	**390.9**	**242.9**			

TABLE 4: GENDER DISTRIBUTION OF CD4 COUNT OF RESPONDENTS.

GENDER	MEAN	SD	PATIENTS NUMBER	P VALUE	T	DF	SE
Male	377.2	181.9	147	0.7562	0.3106	402	23.179
Female	384.4	245.0	257				
Total	381.8	240.8	404				

TABLE 5: DISTRIBUTION OF RESPONDENTS BY CD4 COUNT AND TB STATUS

TB STATUS	MEAN	SD	PATIENTS NUMBER (N)	DF	F	P VALUE
TB Negative	383.9	237.2	367(90.8)	403	1.505	0.223
TB Suspect	350.0	268.7	36(8.9)			
TB Exposed on INH	750	0	1(0.3)			

The overall mean CD4 cell counts of 381.8 cells/mm^3 in this study collaborated similar reports from previous surveys in countries with low resource setting that many patients only seek medical attention and are diagnosed when HIV infection becomes complicated by AIDS defining illnesses (27,28). Patients' CD4 cells distribution varied statistically with disease clinical stage (P value =0.004 and F = 4.512) as were found in similar researches(36-37). High HIV coupling in acquires immunodeficiency syndrome is reported with low CD4 cells count in some studies(5,6,9,16-17). In this study, gender and tuberculosis status of patients were found to be statistically insignificant which was at variant with observations from similar studies(21, 27,29-38).

Under reporting, cultural belief and tradio-medical care in traditional centers of tuberculosis related illnesses may accounts for the insignificant nature of the tuberculosis status on the CD4 cells count.

CONCLUSION: This study showed HIV sero-positive HAART naive patients presented in KSUTH with mean age of 33 years and female preponderance. Majority of patients were in disease clinical stage two and three with a mean CD4 cell counts of 381.8 cells/mm^3. This study showed the need for awareness campaigns to reduce stigmatization, discrimination, rejection suffered by patients and stepping up HIV counseling, testing and access to care and treatment programme.

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