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NJBMB/021/14 SHORT COMMUNICATION

Prevalence of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) among Pregnant Women Attending Antenatal Clinic in a Rural Community in Edo State, Nigeria

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ABSTRACT: HIV in pregnancy is a major problem in antenatal women in Nigeria especially those in the rural areas. The prevalence of HIV/AIDS among pregnant women attending antenatal clinic (ANC) in a rural area was studied; and the immunological status of those on antiretroviral therapy (ART) against those not on therapy was determined. One hundred and Twenty antenatal women aged between 12 and 53 years were screened after pre-test counseling. Questionnaires were administered to all screened pregnant women. The Determine and uni-Gold test kits were used for the HIV screening; while the CD_4 count and full blood count analyses were done with a partec flow cytometer and sysmex automated instrument respectively. This study revealed a prevalence rate of 14.2%, of which 9.2% were already known cases on ART while 5% were newly detected cases that were not on ART. The findings of this study show that the prevalence of HIV /AIDS among pregnant women attending antenatal clinics in this rural community is high due to their low level of awareness of this disease. The study suggested that early initiation of ART will go a long way in reducing the burden of HIV in pregnancyand by extension, minimize the incidence of mother-to-child transmission.

KEYWORDS: Anti-plasmodial, *Plasmodium berghei*, *Bridelia ferruginea*, Malaria, Parasitaemia, Euphorbiaceae

1.0 Introduction

HIV/AIDS in pregnancy is common today in the population. HIV-1 is the main culprit, although HIV-2 causes a similar illness but it is less aggressive. Currently, HIV prevalence among the general population is 3.6% in Nigeria; and national median prevalence among pregnant women is 4.1% (NACA, 2011). Many national antenatal clinic-based HIV surveillance systems in sub-sahara Africa have limited coverage of remote rural sites, a weakness that compromises adequate estimation, monitoring and development of effective preventive and care programmes. In a country such as India, surveillance of HIV infection among pregnant women attending antenatal care clinics has been the mainstay system of monitoring HIV epidemic. A prevalence of 0.41% was discovered among pregnant women attending antenatal clinic in a rural area in India (Giri *et al*., 2012). This is a reflection of a relatively general low exposure of antenatal women to HIV infection. In Pakistan, it was discovered that a simple 'risk assessment questionnaires' can help in identifying pregnant women who need HIV screening. Pregnant women with risk factors, such as sexually transmitted infection (STI) had a higher HIV prevalence (Mahmud and Abbas, 2009).

About 3.1 million people are living with HIV in Nigeria, and about 300,000 new infections occur annually (NACA, 2011). Only 30% of people living with HIV who need antiretroviral therapy (ART) have access to it, and less than 30% of pregnant women have access to prevention of mother-to-child transmission (PMTCT) services (NACA, 2011).

In a study done at the UBTH Benin City, a higher HIV prevalence was discovered among antenatal women with history of sexually transmitted disease (Imade *et al*., 2010).

In 2005 the Federal Ministry of Health, Abuja embarked on a national HIV sero-prevalence sentinel survey in conjunction with national AIDS/STDs control program (NASCP)

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with the objective of determining HIV prevalence and STD among women attending antenatal clinic (ANC) in Nigeria. Surveyed population included 36,931 women aged 15-59 years attending ANC in both urban and rural areas. Data analysis was carried out using UNAIDS/WHO guidelines. A higher HIV prevalence was discovered in those with STDs (Technical support for Ethiopian HIV/AIDS initiative, 2007)

This study was aimed at determining the prevalence of HIV/AIDS among rural women who attend ANC; and also to determine the immunological status and hematological parameters of newly diagnosed HIV patients and those of patients already on treatment with ART

2.0 Materials and Methods

2.1 Assay kits

The Determined HIV – 1/2 kit was obtained from Inverness Medical Co, Ltd Chiba, Japan.Uni-Gold HIV kit was obtained from Trinity Biotech Plc Co., Wicklow, Ireland. EDTA Specimen tube was manufactured by BD Franklin Lakes NJ, USA. Sysmex automated machine was manufactured by TOA medical electronic company,Tokyo Japan. Partec flow cytometer is the product of PartecGmbh Co. Otto Hahn Strabe, Muster, Germany.

2.2 Procedure

Sample was collected by using needle attached to vacutainer EDTA tube. After collecting about 4ml of blood, sample was centrifuged for about 5 minutes to separate the plasma. Then, about 50µl of the plasma was obtained using micro-pipette and applied on the sample pad of the Determine HIV kit. Result was obtained after waiting for about 15 minutes. A pink band on both the test and control area indicates positive result while a pink band only in the control area indicate negative result. Confirmation test for HIV was done by using Uni-Gold HIV kit. Samples of positive result from the Determine test kit were applied to the sample area of the Uni-Gold HIV kit. Those samples that showed pink band in both test and control area were taken as final positive results.

2.3 Study Area

The study was carried out in Udo community in Ovia South-West Local Government Area of Edo State and ethical approval was obtained from medical ethic committee of University of Benin Teaching Hospital, Benin City, Nigeria.

2.4 Study Population

The study populations are pregnant women who attend antenatal clinic (ANC) at the Health Facility in Udo community between the months of September 2012 to November 2012. All women who attended ANC were counseled and tested, adopting the Opt in/opt out approach. A total of one hundred and twenty women aged between 12 and 53 years were screened and questionnaires were administered to all the screened pregnant women.

2.5. Collection and Preparation of Sample

About 4ml of blood was collected by venipuncture and put in an EDTA specimen tube. The sample was allowed to settle in order to separate the plasma.

2.6 Screening Test for HIV

About 1-2 drops of plasma was applied on the Determine test Kit, and the result was obtained after 15 minutes.

2.7 Confirmation Test for HIV

The Trinity BiotecUni-Gold HIV test was labeled with patient information. A disposable pipette was used to apply sample (plasma) over the sample port and result read after 10 minutes.

2.8 Determination of CD4 Count

The CD_4 count was determined using Partec flow cytometer, manufactured by Partec GmbH Co. Germany. Its principle is based on the fact that the mouse monoclonal antibody recognizes the human CD_4 antigen present on a subset of T-lymphoctyes. About 20µl whole blood from

EDTA specimen bottle was added to Franklin test tube. Then 20µl of CD_4mAb was added and mixed gently. It was then incubated for 15 minutes at room temperature. About 800µl of no lyse buffer was added and shaked gently. Sample was then analyzed on a Partec device where counting result was displayed automatically as CD_4T-Cells per µl whole blood.

2.8 Determination of Full Blood Count

This was done using Sysmex automated instrument manufactured by TOA Medical Electronics Company, Japan. Its principle is based on electronic impedance (resistance) which depends on the detection and measurement of changes in electrical resistance produced by cells as they transverse a small aperture. Whole blood sample in EDTA bottle was placed in a special apartment in a Sysmex automated machine .About 20µl of the sample was taken by the machine when the 'start' knob was switched on and result obtained after about 5 minutes in a slip form.

2.9 Statistical Analysis

Statistical analysis of data obtained was carried out using ANOVA.Significant differences were accepted at $P<0.05$.

3.0 Results

Seventeen of the women tested positive for HIV giving a prevalence of 14.2%, however, 6 of them (5%) were newly identified cases.Based on the analysis of the questionnaire provided, there was no statistically significant association between HIV infection and level of education, but the prevalence tended to be higher among the group with no education compared with those who were educated; 55% of those positive for HIV were without education while 45% were those with primary and secondary education.There was a significant decrease in haematocrit of subjects who were HIV positive and were not on ART (i.e. newly discovered cases) as against those who were on ART (i.e. those earlier diagnosed to be HIV positive) and those of the negative control (Table). There was also a significant reductionin CD_4 counts of positive subjects that were not on ART as against those on therapy and those of negative control. A similar trend was observed for red blood cells, platelets, and lymphocytes. There was a significant decrease ($P<0.05$) in hemoglobin concentration of those that are positive for HIV but not on ART over those that were on ART and those of negative control. The mean cell volume (MCV) and mean cell hemoglobin (MCH) of those that were positive but not on ART was significantly higher ($P<0.05$) than those that were on ART and those of the negative control (Table)

4.0 Discussion

The findings of this study revealed an HIV prevalence rate of 14.2% with 5% new cases. This indicates that HIV is still a public health problem among women of reproductive age group in Udo community of EdoState. This prevalence is higher than the 5.2% prevalence found in Benin City (Imade *et al*., 2010), 5.4% in Abakiliki, South-Eastern Nigeria, 3.0% found in Jos, North Central Nigeria, 0.7% found in Abeokuta, South Western Nigeria and 4.0% in Amassoma, Ijaw South Local Government Area of Bayelsa State in Delta region (Imade *et al.*, 2010).Early detection of HIV in pregnancy and timely prevention of mother-to-child transmission (PMTCT) intervention can reduce the risk of HIV transmission to infants from around 30% to less than 2% (Mahmud and Abbas, 2009).

The findings in the table revealed a reduction in red blood cells (RBCs) and thrombocytopenia in those positive that were not on ART. Also, the CD4 level of those positive without ART was lower than that of those positive but on ART, which in turn was lower than those of negative control. The study revealed the importance of early detection and initiation of ART as seen when comparison is made between those positive that were not on ART and those positive and were on ART. There was a significant haematological indices improvement in those that were on ART as against those that were not. The immune status or CD4 level of those that were on ART was significantly higher than those

that were not on ART

In conclusion, since females constitute 58% (about 1.72 million) of persons living with HIV in Nigeria (NACA, 2011), it is important that the epidemic is controlled by creating awareness, screening antenatal women and early initiation of ART for those that are HIV positive.

Table: Haematological parameters of HIV pregnant women attending antenatal clinic in a rural community in Edo State, Nigeria

Parameter	**Status**		
	HIV Positive (not on ART) (n = 6)	HIV Positive (on ART) (n = 11)	HIV Negative (n = 103)
WBC (cells/µl)	5825.00 ± 428.51[a*]	6100.91 ± 221.30[a]	6530.10 ± 92.85[a]
RBC (cells/µl)	3478333.30 ± 60410.63[c]	3793636.40 ± 74079.48[a]	3689611.70 ± 15779.10[b]
PLT (cells/µl)	141,000.00 ± 9615.09[c]	157090.91 ± 25699.12[b]	183029.13 ± 4804.80[a]
HCT (%)	30.03 ± 0.20[c]	33.43 ± 0.48[a]	32.94 ± 0.17[b]
LYM (%)	38.00 ± 1.61[a]	30.55 ± 1.33[b]	29.02 ± 0.63[b]
CD4 (cells/µl)	377.83 ± 24.57[c]	552.18 ± 7.29[b]	651.95 ± 17.67[a]
Hb (g/dl)	10.01 ± 0.20[c]	11.36 ± 0.20[a]	11.12 ± 0.07[b]
MCV (fl)	103.10 ± 2.37[a]	88.60 ± 3.26[b]	89.26 ± 0.68[b]
MCH (Pg)	35.05 ± 1.19[a]	31.00 ± 1.37[b]	30.16 ± 0.25[b]
MCHC (g/dl)	33.78 ± 0.48[a]	34.01 ± 0.17[a]	33.71 ± 0.47[a]

*Means with different superscripts in a row are significantly different at (P<0.05).

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