INDO AMERICAN JOURNAL OF PHARMACEUTICAL RESEARCH

PREVALENCE OF HUMAN IMMUNO -DEFICIENCY VIRUS P24 ANTIGENEMIAS AND MOTHER -TO- CHILD TRANSMISSION RATE AMONG HIV 1 & 2 ANTIBODY- SERO-NEGATIVE APPARENTLY HEALTHY PREGNANT WOMEN IN CALABAR, NIGERIA.

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ARTICLE INFO

Article history
Received 01/12/2020
Available online
31/12/2020

Keywords
Prevalence,
HIV P24 Antigenemia,
HIV 1 & 2,
Mother-To -Child
Transmission Rate,
Pregnant Women.

ABSTRACT

BACKGROUND: Although the routine testing of pregnant women for the Human Immunodeficiency Virus (HIV) antibody is an integral part of Mother to Child Transmission (MTCT) prevention programs, there is still a high rate of MTCT that can be attributed to early acute infection or existence of infected HIV antibody sero- negative pregnant women. AIM: The current study assessed the prevalence of HIV P24 antigens and MTCT rate among pregnant women with HIV antibody sero-negative status aged between 20 years to 49 years in Calabar, Nigeria. METHODOLOGY: About 5ml of blood samples were collected from consented 400 apparently healthy pregnant women and initially analyzed for HIV 1 & 2 antibodies using Determine^{TM} HIV-1/2, Stat-Pak HIV-1/2 and HIV UniGold rapid test kit respectively and P24 antigen using Determine^{TM} HIV-1 & 2 P24 Ag/ Ab Combo test kit. RESULTS: About 12 (3%), 10 (2.5%) and 9 (2.25%) subjects were reactive to Determine HIV 1&, Stat Pak and UniGold test kits respectively with no statistically significant difference between results among study groups (p=0.3065).While 15 (3.75%), 12 (3.0%) and 10 (2.5%) respectively of the 388, 390 and 391 subjects who were initially non-reactive for the three HIV antibody kits became reactive to HIV P24 core antigens with no statistically significant difference between the three antibody test kits and HIV P24 antigen tests (P=0.901). CONCLUSION: The current study found that the prevalence rate of HIV 1&2 P24 core antigen was 1.25 % and MTCT rate was 7.75% in the study population.

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*Please cite this article in press as **Forwah Jacques Ndeh** et al. Prevalence of Human Immuno -Deficiency Virus P24 Antigenemias And Mother -To- Child Transmission Rate Among HIV 1 & 2 Antibody- Sero-Negative Apparently Healthy Pregnant Women In Calabar, Nigeria. Indo American Journal of Pharmaceutical Research.2020:10(12).*

INTRODUCTION

In accordance with a new report released by *Lancet Global Health* in 2020, approximately 121 million unintended pregnancies occurred each year between 2015 and 2019 and out of this number, 61% ended in abortion with implication of 73 million abortions per year **[1].** It is the usual desire, intention and plan of many married couples to get pregnant and each year an estimated 123 million succeed. But a substantial additional number of women approximately 87 million eventually become pregnant unintentionally **[2].** For some women and their partners this may be a pleasant surprise, but for others the pregnancy may be mistimed or simply unwanted. Of the estimated 211 million pregnancies that occur each year, about 46 million end in induced abortion for some reasons and possibly the HIV/AIDS pandemic.

Human immunodeficiency virus (HIV) infection, first described in the 1980s in the USA has continued to spread rapidly [**3**]. Human immunodeficiency is a lentivirus known to cause acquired immunodeficiency syndrome (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections and some malignancies **[4, 5].** There were approximately 38 million people across the globe with HIV/AIDS in 2019 and of these, about 36.2 million were adults and 1.8 million were children (<15 years old). More than 75.7 million people have been infected with HIV since the start of the epidemic **[6].** In 2019, the current national prevalence rate of HIV1&2 in Nigeria was 1.4 percent amongst adults aged between 15-49 years **[7]** while in Cross River State the current HIV prevalence rate is 7.1 % [**8**].

Furthermore, in Nigeria, the Global AIDS Monitoring Group and UNAIDS estimated that in 2019 about 38.0 per cent of pregnant women presented at Antenatal Care clinic (ANC) who were tested for HIV or already knew their HIV status and reported that slightly over a quarter (26.9%) of all cases of Mother-to-Child Transmission (MTCT) of HIV in the world happened in Nigeria **[9].**

During pregnancy, HIV1&2 can pass through the placenta and infect the fetus, whereas during labor and delivery, the baby may be exposed to the virus in the mother's blood and other body fluids **[10].**When a woman goes into labor, the amniotic sac breaks and once this occurs, the risk of transmitting HIV to the baby increases. Most babies who get HIV from their mothers become infected around the time of delivery and breastfeeding also can transmit the virus to the baby **[10].** The transmission of HIV from a HIV-positive mother to her child during pregnancy, labor, delivery or breastfeeding is called "Mother-to-Child Transmission" (vertical and perinatal transmission) **[11, 12].**

In the absence of any intervention, transmission rates range from 15% to 45% and this rate can be reduced to below 5% with effective interventions during the periods of pregnancy, labor, delivery and breastfeeding **[13].**These interventions primarily involve maternal testing, detection and trends of HIV infection among pregnant women, antiretroviral treatment for the mother and a short course of antiretroviral drugs for the baby. They also include measures to prevent HIV acquisition in the pregnant woman and appropriate breastfeeding practices **[14].** HIV antibody testing during pregnancy, with patient consent, is a routine part of prenatal care.An HIV test is recommended for all people who are pregnant, or planning a pregnancy regardless of their risk factors or the prevalence rates where they live. Proper diagnosis and treatment can improve the health of the pregnant woman and greatly reduce the transmission of HIV to the infant **[15].**

The Centre for Disease Control (CDC) and American College of Obstetricians and Gynecologists (ACOG) Committee on Obstetric Practice HIV Expert Work Group on the Prenatal and Perinatal HIV Testing recommended that the "Human immunodeficiency virus testing using the opt-out approach, which is currently permitted in every jurisdiction in the United States, should be a routine component of care for women during pre-pregnancy and as early in pregnancy as possible. Repeat HIV testing in the third trimester, preferably before 36 weeks of gestation, is recommended for pregnant women with initial negative HIV antibody tests who are known to be at high risk of acquiring HIV infection; who are receiving care in facilities that have an HIV incidence in pregnant women of at least 1 per 1,000 per year; who are incarcerated; who reside in jurisdictions with elevated HIV incidence; or who have signs and symptoms consistent with acute HIV infection. Rapid screening during labor and delivery or during the immediate postpartum period using the opt-out approach should be done for women who were not tested earlier in pregnancy or whose HIV status is otherwise unknown. Results should be available 24 hours a day and within 1 hour. If a rapid HIV test result in labor is reactive, antiretroviral prophylaxis should be immediately initiated while waiting for supplemental test results. If the diagnosis of HIV infection is established, the woman should be linked to ongoing care with a specialist in HIV care for co-management" **[16- 19].**

Despite these recommendations for HIV antibody testing in prenatal and perinatal during routine screening and booking of pregnancy, there are still some limitations causing skepticism and uncertainty. This is because of chances of false positive results leading to the infected antibody-negatives in some pregnant women is phenomenal**.** The ideological phenomenon behind the existence of infected HIV antibody-negative individuals were first hypothesized by **[20]** and later by other researchers **[21- 23]** and today in most resource poor countries of the world, the risk of human immunodeficiency virus (HIV) transmission through infected but screened HIV antibody-sero-negative apparent healthy individuals is still an issue of concern **[24]**. These individuals may end up posing as good sexual partners for unsaved sex with risky behaviors **[25]** and it is only HIV p24 screening test that can diagnose HIV in them.

P24 core antigen is one of the most important and distinctive HIV antigen widely studied and it is a viral structural protein that makes up most of the HIV viral core that surrounds viral nucleic acid and can often be detected two weeks after infection. **[26-28]**. High levels of P24 are present in the blood serum (antigenemia) of newly infected individuals during the short period between infection and sero-conversion making P24 antigen assays useful in diagnosing primary HIV infection**[29-31]** based on the timeline .

Since the presence of HIV-1 and HIV-2 viral antigens provides direct evidence of infection **[32],** HIV infection can be reliably diagnosed earlier with combined antibody/antigen tests than with purely antibody-detecting tests alone and hence fourth-generation antibody/antigen tests employed in this study are now the standard screening assay **[33]**

PURPOSE AND OBJECTIVES OF THE STUDY

The current study was designed to assess the prevalence of HIV P24 antigens screening status and mother to child transmission rate among pregnant women with infected HIV 1 and 2 antibody sero-negative status in Calabar, Nigeria aged between 18 years to 49 years ,The specific objectives were geared towards determining the HIV Antibody status as well as HIV P24 core antigen status of subjects and finally to calculate the prevalence and the mother to child transmission rate in the study population.

JUSTIFICATION OF THE STUDY

Findings from this study will highlight the status of HIV P24 core antigen screening in Calabar and the prevalence HIV P24 core antigen and mother to child transmission rate among HIV antibody seronegative pregnant women who may be in the early stage of HIV infection.

MATERIALS AND METHODS

This study adopted a cross sectional approach which was conducted within two years. A convenient and random sampling method in the selection and enrolment of participants who were found to serve as eligible voluntaries and who gave their written and informed consent. About 400 pregnant women were enrolled at the Antenatal Care (ANC) clinic of the University of Calabar Teaching Hospital, Calabar, and Cross River State, Nigeria. The documentation of the study participant's demographics, medical history and clinical background was done using a structured questionnaire.

About 5ml of blood samples were collected from each participant into dried and clean sample containers and the samples were spun at 4000 rpm for 10 minutes to harvest serum which was stored at -20^0C. The screening tests were done within 7 days of sample collection. Ethical approval was gotten from the University of Calabar Teaching Hospital Health Research Ethical Committee (UCTH-HREC). Written informed consent was obtained from all study participants**.**

The statistical analysis was computed using Statistical Package for Social Students (SPSS) Statistics software version 20 (SPSS International Incorporation, Chicago, United States of America). The results of our study were analyzed with the aid of cross tabulations to explore proportional associations between variables and Chi Squared X^2 test and Fischer's exact test was used to explore proportional association between groups. The level of statistical significance was set at $p \leq 0.05$. Comparison among various age groups was done using one way analysis of variance (ANOVA) and Coefficient of correlation (r). Data were expressed as mean plus or minus two standard deviation. The indirect formulae was used for calculating the estimated Mother-to-child transmission rate.

RESULTS

The results of this study are displaced in the **Table 1,2,3,4 and 5** respectively. Out of the four hundred (400) samples collected , 388, 390 and 391 tested negative for HIV antibody using Determine™ HIV-1/2 [(Inverness Medical Japan Corporation, Limited) with 85.7 % sensitivity and 70 % specificity], Stat-Pak HIV-1/2 [(Chembio Diagnostic System International Corporation, United States of America) with 82.4 % sensitivity and 70 % specificity] and HIV UniGold rapid test kit [(Trinity Biotech, United States of America) with 73.68 % sensitivity and 69.56 % specificity] respectively. The specimens were screened for the presence of HIV P24 antigen using the Determine™ HIV-1/2 P24 antigen/antibody (immunochromatographic) protocol (Inverness Medical Japan Cooperation, Limited, United States of America).

Table 1. Shows the frequency distribution of demographic parameters of 430 voluntary apparently healthy subjects according to their turnout rate, level of PMTCT awareness status of HIV infection in Calabar, Nigeria. The mean age and age range were 33.33+7.13 and 20-50 years respectively. It was observed that more subjects turnout rate and level of awareness PMTCT status falls in the age range of 20-25 years (group one), while more subjects who were aware of PMTCT falls in the age range of 26-30 years (group two).The frequency distribution indicates a lower age range percent of distribution of subjects who are not aware of PMTCT. Using t-test there was statistically significant difference between male and female subjects (Calculated t- test =3.0, Degree of freedom (df) =6, alpha value =0.05, t-test critical value =1.943, Right-tail p-value is 0.012, P<0.05).

Table 1: **shows Awareness of PMTCT and turned out rate among study participants.**

DEMOGRAPHIC PARAMETERS		**TURN OUT RATE AND PMTCT AWARENESS STATUS**							
Groups Number	**Age Range (Years)**	**Number of subjects that are Not aware of PMTCT**		**Number of subjects that are aware of PMTCT**		**Total number of subjects that turned out**		**F-ratio**	***p*-value**
		Frequency (f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**		***P*=0.05**
1	20-25	79	18.37	36	08.37	115	26.74		
2	26-30	51	11.86	100	23.25	151	35.11		
3	31-35	36	08.37	60	13.95	96	22.32		
4	36-40	40	09.30	18	04.18	58	13.48	5.125	**
5	41-45	00	00	10	02.32	10	2.32		.008
6	46-50	00	00	00	00	00	00		
Total (n)		206	47.90	224	52.09	430	100		
Calculated t-value			3.0						
P-value			.012*						

n =total number of samples, frequency =**f** and percentage =**%**

*Using t-test there was a statistically significant difference between subject turn out and level of awareness of HIV infection by subjects (Calculated t- test =3.0, Degree of freedom (df) =6, alpha value =0.05, t-test critical value =1.943, Right-tail p-value is 0.012, P<0.05) and

**Using ANOVA there was a statistically significant difference between age range and number of groups F-ratio=5.125, Degree of freedom (df) =6, 12, alpha value =0.05, F-test critical value =3.00, Right-tail p-value was 0.008, P<0.05.

Table 2a: willingness for voluntary counseling and HIV testing before Pre-test counseling for HIV test.

DEMOGRAPHIETERS		**BEFORE PRETEST COUNSELLING, KNOWLEDGE, ATTITUDE AND WILLINGNESS OF SUBJECTS TO PARTICIPATE IN PMTCT ACTIVITIES**							
Groups Number	**Age Range (Years)**	**Number of subjects that are Not willing to participate in VCT**		**Number of subjects that are willing to participate in VCT**		**Total number of subjects that turned out**		**F-ratio**	***p*-value**
		Frequency (f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**		***P*=0.05**
1	20-25	79	18.37	36	08.37	115	26.74		
2	26-30	51	11.86	100	23.25	151	35.11		
3	31-35	36	08.37	60	13.95	96	22.32		
4	36-40	40	09.30	18	04.18	58	13.48	5.125	** .008
5	41-45	00	00	10	02.32	10	2.32		
6	46-50	00	00	00	00	00	00		
Total (n)		206	47.90	224	52.09	430	100		
Calculated t-value			3.0						
P-value			.012*						

Willing group had the highest number of subjects between the age ranges of 26-30 years and lowest between the age range of 41-45 years while the non-willing group had the highest number of subjects between 20-25 years and the lowest number of subjects between the age ranges of 31-35 years.

Table 2b: Pregnant women knowledge, attitude and distribution of study participant according to willingness for voluntary counseling and willingness to participate in HIV testing after Pretest HIV counseling.

	AFTER PRETEST COUNSELLING,KNOWLEDGE, ATITUDE AND WILLINGNESS TO PARTICIPATE IN PMTCT AND VCT ACTIVITIES			
Groups	**Age (Years)**	**Number of subjects not willing to do VCT (n= 176(44%) after pretest counseling**	**Number of subjects that are willing to do VCT (n= 224 (56%)**	**Total number n=400(100%)**
1	20-25	79(44.98)	36(13.59)	115(28.75)
2	26-30	51(29.97)	100(44.69)	151(37.75)
3	31-35	36(20.45)	60(26.78)	96(24.00)
4	36-40	10(5.68)	18 (8.04)	28(7)
5	41-45	0(0.00)	10(4.64)	10(2.50)
6	46-50	0(0.00)	00	00

The majority of willing subjects were aged between 26-30 years while the non-willing had the majority in the age range 20-25 years. A total of 30 subjects declined, unwilling to participate in VCT and PMCT activities for many reasons.

As shown in **Table 3** out of the 400 subjects screened for HIV I &2 antibodies, 12(3%) were reactive to HIV 1 & 2 Determine test kit, 10(2.5%) to Stat Pak, and 9(2.25%) to UniGold rapid test kits making a total of 31 (7.75%). Using the ANOVA statistical stool, there was no statistical significant difference between the % positivity of the three types of the antibody test in the 17 (04.25%) First Time Tested Subjects and 14 (03.25%) many time tested subjects.

Table 3: Shows Prevalence of HIV I & 2 antibody screening test based on PMTCT status.

	HIV DETERMINE ANTIBODY TEST KIT				**HIV STAT-PAK ANTIBODY TEST KIT**				**HIV UNI-GOLD ANTIBODY TEST KIT**				**T0TAL**	
PMTCT STATUS	**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of Subjects tested Negative**		**TESTED REACTIVE TO BOTH TESTS**	
	F	**%**	**F**	**%**	**f**	**%**	**F**	**%**	**f**	**%**	**F**	**%**	**f**	**%**
FTTS	6	(1.5)	170	(42.5)	7	(1.75)	169	(42.25)	4	(1)	172	(43)	17	04.25
MTTS	6	(1.5)	218	(54.5)	3	(75)	221	(55.25)	5	(1.25)	219	(54.75)	14	03.25
Total (n)	12	(3)	388	(97)	10	(2.5)	390	(97.5)	9	(2.25)	391	(97.75)	31	7.50
F –ratio						1.7997		(p>0.05). *						
P-value						0.307 (P>0.05). **								

*There was no statistically significant difference between the positive results of the three HIV 1 & 2 antibody screening test kits despite the disparity in the percentage positivity. (F -ratio = 1.7997, df1 = 2, df2 = 3, F-critical value = 9.55, at alpha value of 0.05, Right-tail p-value is 0.307)

**Using t-test there was no statistically significant difference between the mean positive results of the three HIV 1 & 2 antibody screening test kits in First Time Tested subjects and Many Time Tested subjects (Calculated t- test =2.5, Degree of freedom (df) =2, alpha value =0.05, t-test critical value =1.943, Right-tail p-value is s 0.06481, Many Time Tested subjects=FTTS and First Time Tested subjects=MTT

Table 4 shows the frequency distribution of the results of the HIV 1 and 2 P24 antigens screening test done on the 388, 390 and 391 sera samples screened as HIV 1 and 2 antibody -negative using Determine, Stat -Pak and UniGold rapid test kits respectively. It was observed that the HIV1&2 and P24 antigens screening test kit detected 15(3.75%), 12(3.07%) and 10(2.55%) out of 388, 390 and 391 sera samples previously screened as HIV 1 and 2 antibody -negative using Determine, Stat -Pak and UniGold rapid test kits respectively. It was also observed that out of the 388 HIV 1 and 2 antibody–negative screened using Determine, 15 samples reacted while 373 were non-reactive to P24 screening. Out of the 15 reactive samples, 14 sera samples were from the First Time tested group and only 1 sera sample was from the group that had been tested before. A total of 162 non-reactive sera samples were from the first tested group while 211 sera samples were from the tested before group. For Stat -Pak, out of the total of 12(3.1%) that tested reactive to HIV 1& 2 P24 antigen screening test, 7(1.8%) were in the first tested group and 5 (1.3%) were in the tested before group. There were 169 (44.70%) non-reactive for the first tested group, 209(55.29%) for the tested before group which gave a total of 378 (96.9%). For UniGold, 6(1.5%) were from the first time tested and 4 (1%) were from the tested before group.

Table4: Shows P24 antigen screening of screened HIV 1 & 2 antibody- sero-negative sera according to PMTCT status.

	HIV DETERMINE ANTIBODY TEST KIT				HIV STAT-PAK ANTIBODY TEST KIT				HIV UNI-GOLD ANTIBODY TEST KIT				TOTAL	
PMTCT Status	**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Total Number of subjects tested positive for both kits**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**f**	**%**
FTTS	14	(1.5)	162	(42.5)	7	(1.75)	169	(42.25)	6	(1.5)	172	(43)	27	(6.75)
MTTS	1	(1.5)	211	(54.5)	5	(1.3)	221	(55.25)	4	(1.25)	219	(54.75)	10	(2.5)
Total (n)	15	(3)	373	(97)	12	(3.1)	378	(97.5)	10	(2.25)	391	(97.75)	37	(7.75)
F -ratio				0.10734										
P-values	0.901													

*****Using ANOVA there was statistically significant difference between the % positivity in FTT and MTT subjects (F - ratio = 0.10734, df1 = 2, df2 = 3 Alpha value =0.05, F-critical value =9.55, Right-tail p-value is 0.9015). Many Time Tested subjects=**FTTS** and First Time Tested subjects=**MTTS**

Table 5 shows the frequency distribution HIV 1 and 2 P24 antigen screening test done on only HIV antibody- positive subjects in Calabar, Nigeria .It was also observed that only 2(16.66%) of the first time tested samples, 2 (0.2%) of the first time tested samples , and 1(0.11 %) of the tested before sample that tested positive previously to Determine, Stat-Pak and UniGold HIV 1&2 test kits respectively reacted positively to the HIV 1& 2 P24 antigen screening test method giving a total of 5(1.25%) samples with both antigens and antibodies.

Table5:**Shows frequency distribution of the results of HIV1&2 p24 antigen screening test done on the HIV antibody- positive subjects according to PMTCT status .**

	HIV DETERMINE ANTIBODY TEST KIT				HIV STAT-PAK ANTIBODY TEST KIT				HIV UNI-GOLD ANTIBODY TEST KIT				TOTAL			
PMTCT status	**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Number of subjects tested Positive**		**Number of subjects tested Negative**		**Overall number of subjects that tested reactive to P24 test kit**		**Overall number of subjects that tested non - reactive to P24 test kit**	
	F	**%**	**F**	**%**	**f**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**f**	**%**	**F**	**%**
FTTS	2	(20)	2	(20)	2	(25)	3	(37.5)	00	(00)	4	(50)	4	1	9	2.25
MTTS	00	(00)	6	(80)	00	(00)	3	(37.5)	1	(12.5)	3	(37.5)	1	0.25	12	3.0
Total (n)	2	(20)	8	(80)	2	(25)	6	(75)	1	(12.5)	7	87.5	5	1.25	21	5.25
P values	*P*=0.3038 (P<0.05)*															

*Using ANOVA statistical stool there was no statistical significance difference between the % positivity in FTT and MTT subjects (the calculated F-ratio =0.4096, at degree of freedom (df) =2, 3, alpha value =0.05, the F-critical value =9.55. The obtained F-ratio value (0.4096) is less than the F- critical value (9.55) and *P*=0.3038 at alpha value =0.05)

DISCUSSION

The Prevention of Mother to Child Transmission of HIV (PMTCT) program which was started in 2001 by the World Health Organization (WHO) aimed to reduce the spread of HIV from mother to child, as it is known that more than 90% of pediatric HIV infection is from mother to child transmission of the virus.**[34,35]**

Today HIV /AIDS still remains a global health problem constituting one of the health and developmental challenges in Nigeria. It affects all the geopolitical zones, states, urban and rural locations in the country with very wide variations.

In **Table 1,** the disparity and inequality in the results of this study based on the two groups that is First Time Tested subjects and Many Time Tested subject are global and are in line with the observations of other studies **[36]** of a disparity in the awareness of PMTCT program and treatment in Kano, Nigeria. This is also in line with work of **[37**] who noticed a sharp variation of disparity in PMTCT programs associated with HIV infection in Guinea -Bissau. This means that the Many Time Tested Subjects who were already aware of PMTCT programs, would be willing to participate in any PMTCT activity than those in First Time tested group. It also means that more awareness about HIV infection would have to be targeted towards the First Time Tested group that are not fully aware of PMTCT activities **[38]**.The lowest percentage turn out rate fall in the age range between 41 to 50 years (group four to group six) which is in line with previous reports **[39].**

Table 2a that out of the 430 subjects recruited, 224 (52.09 %) were willing to undertake voluntary counseling as well as to submit samples for voluntary HIV testing and this constituted as subjects already in the PMTCT Program, while 206 (47.90%) were unwilling to submit samples for HIV voluntary testing, but they accepted to do only voluntary counselling to know more about the PMTCT program. These subjects constitute as the First Time Tested Subjects. This means that the disparity in these results were not really statistically significant (the right tail P-value is 0.3065 at alpha value =0.05 (P>0.05) after the pretest counseling. The reasons for these results are obvious as documented by other studies **[40-43].**

In **Table 3** the prevalence rate of the antibody is demonstrated by the three antibody screening test kits However , these results were higher when compared to the current prevalence rate of 7.1 % of HIV 1 and 2 infection in Cross Rivers State, Nigeria , in the general population from which these subjects were drawn from as reported by **[8[a]]** . The decrease in the percentage positivity of those subjects who have tested was partly due to the increased impacts, awareness ,social sensitization , vigorous campaigns and the VCT programs created by the government and partly due to the PEPFAR and GHAIN centers which are gaining ground in the study area as reported by **[44,45]**. The observed lower percent of the positive results with the HIV 1& 2 antibody screening test method could also be attributed to the fact that most of the subjects had not yet been sero-converted or were still in their window period as reported by **[46-48].**

In Table 4, a total of 10(2.55 %) was positive and the total of negative were 172 (44.61) for First Time Tested group, and a total of 219(51.38) were for the Many time tested group and total negative of 381 (97.44%).The overall reactivity of P24 was 37 (7.75%) that is 27(6.25%) from first time tested subjects and only 10(2.25%) from Many Time Tested subjects. These results are in line with the reports of **[49, 50]**. This means that the disparity in results between First Time Tested and Many Time tested subjects were not statistically significant (P>0.05) **[51]**.

In **Table 5,** the results may actually demonstrate that it was not long that these subjects seroconverted. This is in line with work of **[52, 53]** who have made a review on early acute diagnosis of HIV infection. This could also mean that these subjects were still having detectable HIV 1& 2 p24 antigens as well as the antibodies in their blood and in this case the results agree with **[54-56]**. The HIV 1 & 2 P24 screening test method is able to detect HIV antigens only in early stage of HIV infection (pre-seroconversion and per-seroconversion) than the HIV 1 & 2 antibody screening test method which detects antibodies only after sero-conversion. Despite this limitation and disadvantage of the HIV 1& 2 antibody screening test method, it is continuously being used in routine work as a method of choice because of its lesser cost effectiveness, easy availability, rapidity and the fact that it requires no extraordinary skilled staff training. **[57,** 58].

CONCLUSION

This study found out that the prevalence of HIV 1&2 P24 core antigen was 1.25 % and mother to child transmission rate was 7.75% in the study population .This study also confirmed the lapses associated with the HIV antibody screening test kits.

RECOMMENDATION

The use of P24 core antigen screening test is very much recommended in the PMTCT program especially for subjects at early stage of HIV infection.

AUTHORS' CONTRIBUTIONS

1) Conception of study: FJN
2) Design of study: FJN and IIE
3) Sample analysis: FJN, UOA
4) Data analysis: FJN, EWO & IIE
5) Statistical analysis: FJN, EWO and UOA
6) Initial manuscript draft: FJN, EWO and UOA
7) All authors read and approved the final manuscript.

FUNDING:

This study was funded by the Author

AVAILABILITY OF DATA AND MATERIALS:

Data sets generated and analyzed in this study are available from the corresponding author on request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by Health Research Ethical Committee (HREC) of the University of Calabar Teaching Hospital. Oral informed consent was obtained from the participants and same was approved by the ethical committee.

CONSENT FOR PUBLICATION: Not applicable

COMPETING INTERESTS:

The authors declare that they have no conflict of interest

ACKNOWLEDGEMENT
Not applicable.

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