

Research Article

Prevalence of Human Immuno-deficiency Virus (HIV) Among Pregnant Women in Kano Metropolis, Kano Nigeria

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Abstract

The prevalence of Human Immunodeficiency Virus (HIV) among pregnant women is a critical public health issue, particularly in sub-Saharan Africa. This study examines the prevalence of Human Immunodeficiency Virus (HIV) among Women in Kano Metropolis, Kano Nigeria. The experimental research design was adopted for the study, purposive sampling techniques was used to select an element from the study population. Sample size of three hundred and seventy nine (379) using Yaro Yamone's formula. Purposive sampling techniques was used to draw a sample from the population. The data was collected from 255 women attending antenatal care in Waziri Shehu Gidado Hospital, Kano metropolis between the months of September 2019 to October 2019. Only those tested were used as the sample. The study observed that no serious increase or decrease even though preventive and control measures have been put in place by Government to curb the scourge and the results from analysis revealed that age plays a major role in the infection rate, therefore, there is need to device a means of preventing and controlling the infection. In conclusion women that are sexually active are more prone to be infected with HIV which are in the age bracket 25-34 years and pregnant women attending antenatal care service should undergo HIV test.

1. Introduction

Human Immunodeficiency Virus (HIV) remains a significant public health concern worldwide, particularly in sub-Sahara Africa, where is disproportionately affects women of reproductive age. Vertical transmission of Human Immunodeficiency Virus (HIV) is still a major

challenge in the world, especially in the developing countries. It is estimated that 90% of HIV infections in children result from mother-to-child-transmission [1]. In the absence of any intervention to prevent MTCT (PMTCT), the MTCT rate varies between 13% and 48% maternal combination antiretroviral therapy (ART) together with postnatal interventions has demonstrated its efficacy in substantially reducing the risk of MTCT in African breastfed children to less than 5% [1].

The World Health Organization (WHO) guidelines recommend that all pregnant women should be tested for HIV in the first trimester and that a second test be considered in the third trimester by 34 weeks of gestational age. Guidelines in resource-limited settings are increasingly recommending HIV testing as early as possible during pregnancy and repeat testing towards the end of pregnancy or during labour, a strategy that has proven to be cost effective. Despite these recommendations, recent studies show relatively high rates of seroconversion during pregnancy in Africa. HIV incidence rates of 10.8% in serodiscordant couples in Kenya whenever a pregnancy occurred, a lower seroconversion rate of 1% amongst pregnant women in Malawi. More recently, a meta-analysis published in 2014 reports an aggregate seroconversion rate of 3.8 per 100 person-years in African countries [2].

The availability of prevention of mother-to-child transmission (PMTCT) services has improved over time, yet challenges such as stigma, lack of awareness, and inadequate health care infrastructure hinder effective intervention. National estimates place the overall pooled prevalence of HIV among pregnant women in Nigeria at 7.22%, with regional variations, underscoring the need for localized strategies [3].

Acquire immune deficiency syndrome (AIDS) is the most unwelcome visitor of 20th century. It has been disturbing and posing a great threat to human race and world population. Since the discovery of AIDS in 1981 in America there has been tremendous rise in the cases of number of deaths. The prediction of doom by some local and international organization like United Nations is turning into reality. The future is as uncertain as to what will become of developing countries like Nigeria. Where the scourge is gradually taking its toll on the population. [4].

In 2014 about 36.9 million people were living with HIV and it resulted in 1.2 million deaths. Most of those infected live in sub-Saharan Africa. Between its discovery and 2014 AIDS has caused an estimated 39 million deaths worldwide. HIV/AIDS is considered a pandemic a disease outbreak which is present over a large area and is actively spreading. HIV is believed to have originated in west-central Africa during the late 19th or early 20th century. AIDS was first recognized by the United States Centers for Disease Control and Prevention (CDC) in 1981 and its cause HIV infection was identified in the early part of the decade [5].

Both HIV-1 and HIV-2 are believed to have originated in non-human primates in West-central Africa and were transferred to humans in the early 20th century. HIV-1 appears to have originated in southern Cameroon through the evolution of SIV (cpz), a Simian Immunodeficiency Virus (SIV) that infects wild chimpanzees (HIV-1 descends from the SIV (cpz) endemic in the chimpanzee subspecies *Pan troglodytes troglodytes*). The closest relative of HIV-2 is SIV (smm), a virus of the sooty mangabey (*Cercocebus atys*), an Old-World monkey living in coastal West Africa (from southern Senegal to western Côte d'Ivoire). New World monkeys such as the owl monkey are resistant to HIV-1 infection, possibly because of a genomic fusion of two viral resistance genes. HIV-1 is thought to have jumped the species barrier on at least three separate occasions, giving rise to the three groups of the virus, M, N, and O [6].

There is evidence that humans who participate in bush meat activities, either as hunters or as bush meat vendors, commonly acquire SIV. However, SIV is a weak virus which is typically suppressed by the human immune system within weeks of infection. It is thought that several transmissions of the virus from individual to individual in quick succession are necessary to allow it enough time to mutate into HIV. Furthermore, due to its relatively low person-to-person transmission rate, SIV can only spread throughout the population in the presence of one or more high-risk transmission channels, which are thought to have been absent in Africa before the 20th century [6].

An alternative view holds that unsafe medical practices in Africa after World War II, such as unsterile reuse of single use syringes during mass vaccination, antibiotic and anti-malaria treatment campaigns, were the initial vector that allowed the virus to adapt to humans and spread [6].

Nigeria has an HIV prevalence of 4.4%, and the mode of transmission of the disease is largely through unprotected sex (80%), mother-to-child transmission (MTCT), contaminated blood and blood products and use of contaminated objects or instruments. HIV infection in pregnant women is a worldwide problem. The United Nations AIDS [7] and World Health Organization [8] estimates that at the end of 2005, there were 17.5 million women worldwide with HIV infection. Close to 600,000 children are infected with the virus each year by MTCT, and the majority of these cases are in Africa. About 90% of the HIV-infected children acquire the infection from their mothers during pregnancy and childbirth. The estimated rate of MTCT of HIV without intervention is 25–45% (during pregnancy - 5–10%, during delivery - 15–20%, during breast feeding - 5–15%). The risk factors include high levels of maternal viral load, vaginal delivery, prematurity and breast feeding, among others [8].

HIV/AIDS remained a major public health challenge in Nigeria, with approximately 1.9 million people living with HIV (PLHIV), making it one of the most affected countries globally [9].

Efforts to address the prevalence of HIV among pregnant women in Kano must focus on strengthening antenatal care services, increasing the uptake of antiretroviral therapy (ART), and enhancing community-based education to mitigate stigma and ensure better health outcomes for mothers and their infants [10].

Kano, one of Nigeria's largest and most populous cities, has recorded variable HIV prevalence rates among pregnant women over the years. A study conducted at Aminu Kano Teaching Hospital reported an HIV prevalence of 5.9% among antenatal attendees, with an increasing trend observed from 2004 to 2006 [11]. The findings reflect the ongoing burden of HIV in the region, necessitating consistent efforts in prevention, early diagnosis, and treatment. Therefore, the study aims to examine the prevalence of HIV among pregnant women in Kano metropolis, Kano Nigeria.

2. Material and Methods

Study area

This research was carried out at Waziri Shehu Gidado General Hospital in Dala Local Government Area of Kano State, Nigeria. For a period of three months (August, 2019–October, 2019). Waziri Shehu Gidado hospital is located along Katsina road in Kano state after Riyar le

The people that mostly patronizes the hospital are predominantly Hausa -Fulani, and few other tribes, which include Yoruba, Ibo. Nufe and people from Niger republic, of low socioeconomic and literacy status. Work force of the hospital is 398 staff in the following category, 10 medical Doctors, 50 nurses/midwives, 40 community health workers, 5 pharmacists 4 medical laboratory technologist and other staff which comprises of sub staffs and staffs on contract. The services rendered includes among others, general medical practice (in/out patient), drugs dispensing, immunization services, labor and delivery, laboratory and HIV testing and counselling.

Study Design

This study adopted experimental survey research design to assess the incidence of HIV among pregnant women attending antenatal care (ANC) in Waziri Shehu Gidado Hospital, Kano state.

Population of the Study

The study population for the research were pregnant women attending antenatal clinic at Waziri Shehu Gidado General Hospital Kano state. The client are normally residents of the local government that bordered the hospital.

Sample and Sampling Techniques

This is a purposeful sampling technique was used for the selection of the study population. A total of three hundred and seventy-nine samples from the study subjects were collected and analyzed for presence of antibody against Human Immunodeficiency Virus (HIV). Subjects selected for this study were pregnant women attending antenatal at Waziri Shehu Gidado General Hospital, Kano state, who have consented and are willing to participate in the research.

Sample Size Determination

Using the YaroYamone's formula for minimum sample size estimation in health studies;

$$n = \frac{NZ^2p(1-p)}{(N-1)E^2 + Z^2p(1-p)}$$

Whereas; N = 5000 (population size), Z = 1.96 (Z-score for 95% confidence level), p = 0.5 (estimated population proportion), E = 0.087 (desired margin of error),

$$n = 255$$

Thus, the minimum sample size was obtained 255.

Sample Collection

The method of data collection is by aseptic collection of blood using sterile 2 ml hypodermic syringe. Blood samples were collected by a trained community health practitioner working in the antenatal unit, using the venipuncture technique. A soft tubing tourniquet was fastened on to the upper arm of the subject to enable the index finger feel a suitable vein. The puncture site was then cleaned with methylated spirit and venipuncture was made with the aid of a needle attached to a 2 ml syringe, after which 2 mls of blood was collected and transferred into a labeled ethylene-diamine-tetra-acetic acid (EDTA) container.

HIV Screening Test

The test is an in-vitro immune chromatographic (lateral flow) test for the qualitative detection of antibody to HIV I and II in human serum, plasma or whole blood. The sera collected were arranged in a rack with each sample appropriately labeled. By folding and tearing at perforated points, the desired numbers of strips are removed and arranged on the work bench. With the aid of sterile micro pipettes, 2 drops of the serum were dropped on the test pad and allowed to migrate to the patient line and site, the preparation was allowed to stand on a flat surface for 15 minutes and the result read. Negative and positive controls were setup along with the test according to manufacturer's instruction.

Principle of the Test

Determine HIV I and II is an immune chromatographic test for the qualitative detection of antibody to HIV I and II. When serum/plasma is added to the sample pad, the samples migrate through the conjugate pad; it constitutes and mixes with the selenium colloid antigen conjugate. This mixture continues to migrate through the solid phase to immobilized recombinant antigen and synthetic peptide sat the patient's window site. If antibodies to HIVI and II are present in the sample, the antibody binds to the antigens selenium colloid and to the window site forming a red line (positive) at the patient's window site, but if antibodies to HIV I and II are absent the antigens selenium colloid flows past the patient's window site and no red line is formed at the patient's window site.

Data Analysis

The information gathered from the result of the determine would be analyzed using the expression in percentage.

3. Results

The data was collected from 255 antenatal mother attending clinics between the month of September 2019 to October 2019. Only those tested were used as the sample, no questionnaire. the data is grouped in accordance with the number of parities which is from prim gravida, gravida 2 to gravida 5, and gravida 6 and above.

Age

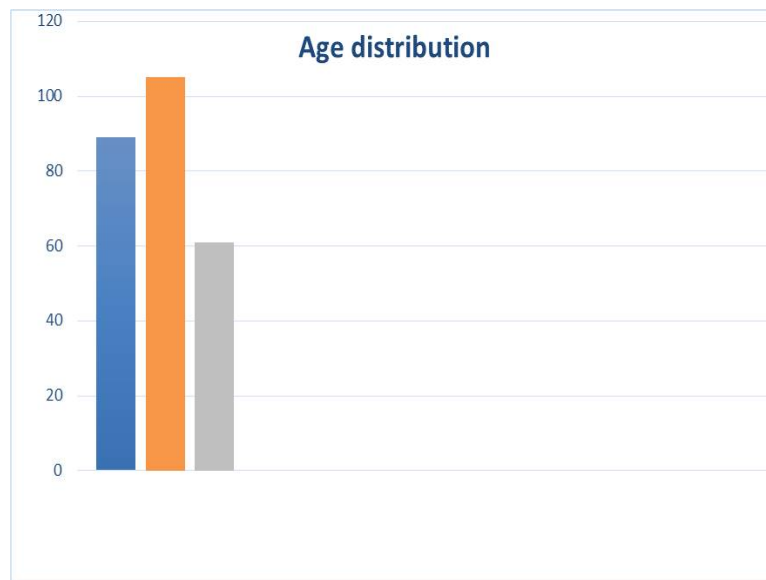


Figure 1: Demographic Information

The Figure 1, above shown that Age distribution is 15-24 is 89, 25-34 is 105, 35 and above is 61.

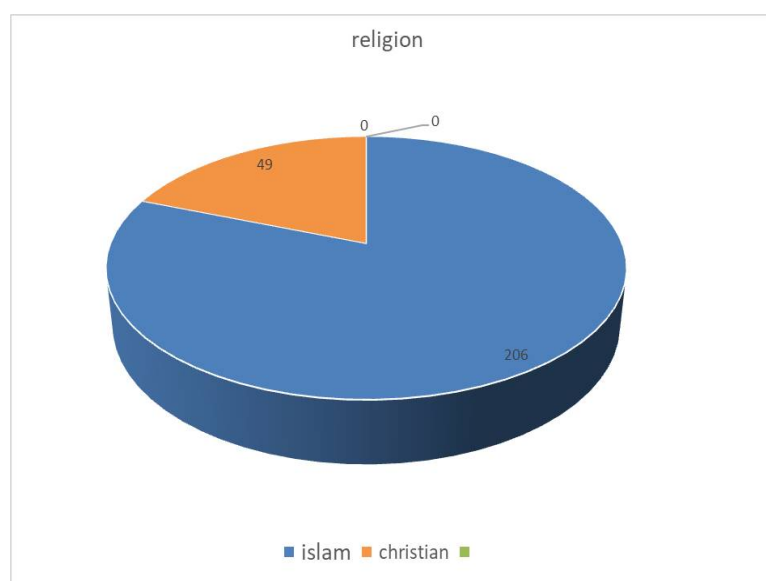


Figure 2: Religious Affiliation

The Figure 2 above shows that Majority of the of the participant are Muslims 206 (81%), 49 Christian (18%).

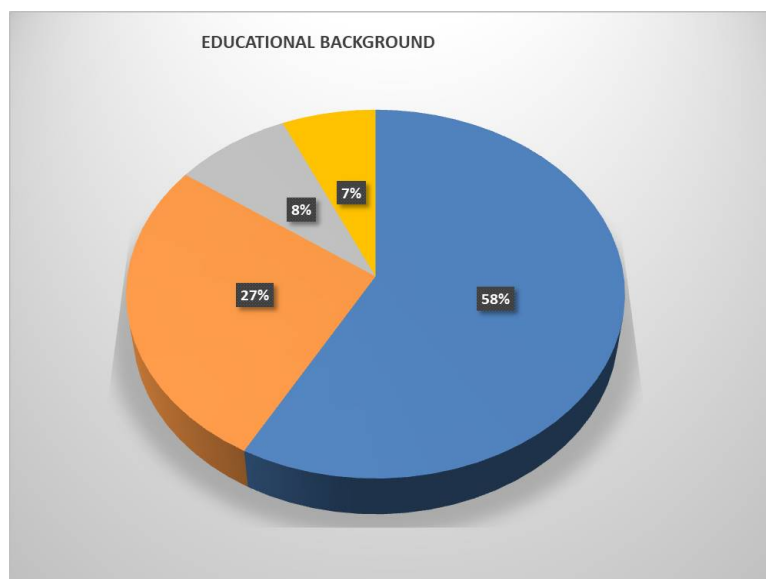


Figure 3: Educational Background

Figure 3 above shows that 69(27%) primary school, 148(58%) secondary school, 21(8%) and 17(7%) Qur'anic school.

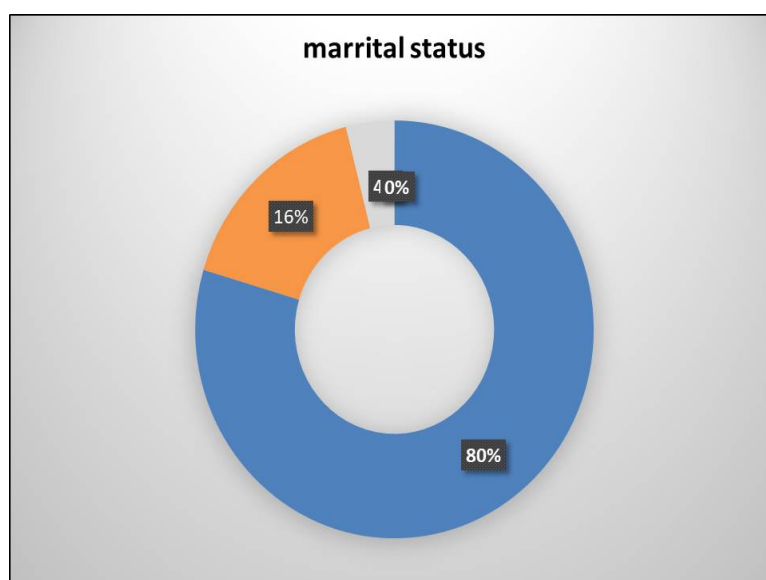


Figure 4: Marital Status

Figure 4 above shows that Majority of the of the participant are married 203 (80%),42 widows (16%), and divorce (4%).

Does pregnant most accept and conduct HIV testing and counselling services during ANC?

Table 1: Distribution by month (September 2019 to October 2019).

Month	week	Positive	Negative	invalid	Total
September	first	3	26	3	32
	second	3	24	3	30
	third	6	27	3	36
	fourth	5	29	2	36
October	First	6	25	2	33
	second	4	26	3	33
	third	5	25	6	36
	Fourth	3	16	0	19
Grand Total		35	198	22	255

Table 1 shows that this research work was based on the schedule visit of women attending ANC in the study area: Mondays are the schedule days for women coming in for their first visit. The table above shows result of client tested the months of September and October 2019. A

total 255 clients were tested, 35 clients tested positive which represents 13.7%, 198 clients tested negative which represents 77.6% and 22 clients tested invalid based on the test kit result.

Which age group is the most vulnerable for HIV infection?

Table 2: Distribution by age.

Age	Positive (%)	Negative (%)	Invalid (%)	Total (%)	incidence
15-24yrs	10	70	10	90	3.9
25-34	15	60	5	80	5.8
>35yrs	10	68	7	85	3.9
Grand total	35 (13.7 %)	198(77.6%)	22(8.6%)	255(100%)	

Table 2 above shows that, out of 90 clients aged 15-24years tested during the research work 10 clients tested positive which represent 3.9%, seventy (70) tested negative which represent 77.7%, 10 clients tested invalid based on the test kit result. In 25-34years age group out of 80 clients tested for HIV, 15 tested positives which represents 5.8%, 60 clients tested negative which represent 75% while 5 clients tested invalid based on the test kit result, also in the age group of 35years and above, out of 92 clients tested, 10 clients tested positive which represent 3.9%, 68 clients were tested negative which represents 73.9%.

4. Discussion

The incidence of HIV infection in pregnant women is of grievous consequence to the offspring as over 50% of babies born to HIV positive mothers are HIV positive. An estimated 53% of pregnant women living with HIV in the developing world, Nigeria inclusive receive antiretroviral drugs to prevent them from transmitting the virus to the babies. From the total number of samples screened, it was observed that about 13.7% tested HIV positive: this result is reasonably high and corresponds with similar results obtained from research conducted by National Agency for Control of AIDS [8]. NACA's result showed that Nigeria accounts for around 10% of the global HIV burden, this figure is not surprising because, as at 2011, the then Nigerian Minister of Health acknowledged the extent of the challenge in controlling the infection when he stated that "HIV and AIDS epidemic in Nigeria remains a public health problem of enormous magnitude that must be given priority attention". It was also observed that the infection was more prevalent among pregnant women within the age group 25-35 years tested, 15 out of 35 positive cases. Table 1 these findings also correspond with the findings of Menakeya. (1999). This result is also not surprising because members of this age group are sexually active and makes up about 70% of the total number of pregnant women worldwide. The high incidence rate among this age group may also be as a result of the polygamous nature and extramarital lifestyle of their partners thus making them vulnerable to HIV infection. Another important reason for this high incidence rate might also be due to culture and tradition. The result also revealed that the incidence of HIV sero-positivity is not associated with season or months there is no specific season or month in which persons are most susceptible to acquiring the infection. Incidence of sero-positivity seems to be static Table 1 i.e. no serious increase or decrease even though preventive and control measures have been put in place by Government to curb the scourge. Therefore, there is still much work to be done with respect to prevention and control of the infection.

5. Conclusion

The incidence of HIV and AIDS is a serious public health issue and this research has revealed that it is a problem in Kano State. Results from analysis revealed that age plays a major role in the infection rate, therefore, there is need to devise a means of preventing and controlling the infection. These measures should also target the most affected age group which is 25-35 years.

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