HIV sero-conversion among pregnant and breast-feeding mothers and the risk of vertical transmission of HIV in Nigeria (Case Series Reports)

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ABSTRACT

Objectives: 1) To raise awareness on seroconversion among ANC clients and nursing mothers with respect to vertical transmission of HIV infection.
2) To advocate for regular repeat HIV testing among women during the risky period of mother to child transmission of HIV especially in high burden countries.
Methods: A case series reports of 4 women who seroconverted while still in anti-natal care and during breastfeeding in 2 public hospitals in southwest Nigeria.
Results: Three out of the five babies whose mothers seroconverted were HIV infected as confirmed by HIV DNA PCR test.
Conclusion: Re-screening for HIV during the course of pregnancy, delivery and breastfeeding is therefore recommended to identify pregnant and nursing mothers who may seroconvert or get newly infected especially during this risky period of mother to child transmission of HIV. This would allow the necessary PMTCT interventions to be initiated early and protect children from HIV infection.

KEY WORDS: **Human Immunodeficiency Virus**
Seroconversion
antiretroviral drugs
Prevention

Introduction

Globally there are about 36.6 million people living with HIV infection and about 70 % (25 million) of these live in Sub-Saaharan Africa [1]. Nigeria has the second highest burden of HIV infection with about 3.1 million of the population living with HIV infection [2]. Mother to child transmission of HIV infection (MTCT), which accounts for 10% of all transmissions is responsible for 90% of paediatric HIV infections [3]. In 2014, 3 million children were living with HIV and 220,000 of these were newly infected worldwide [1]. Nigeria also accounts for 30% of the global burden of vertical transmission of HIV infection, making it the greatest contributor to the global paediatric HIV burden [4]. Prevention of mother to child transmission (PMTCT) is a set of strategic interventions that reduce the rate of transmission of HIV infection from mothers to their infants [5]. These strategies include HIV counseling and testing, the use of antiretroviral drugs in both the mother and the newborn, safe obstetric practice and safe infant feeding. These interventions are so effective that they have been proven to reduce the rate of vertical transmission to as low as 1%, compared to the highest rate of 45% obtained in scenarios where there was no intervention [3]. An intensified form of PMTCT intervention can give rise to what is known as eMTCT, Elimination of Mother to Child Transmission of HIV infection; a scenario where vertical transmission of HIV infection no longer constitutes to a public health problem as achieved in Cuba recently [6]. However, one of the limitations of achieving this level of reduction of vertical transmission in resource poor settings is the gap constituted by seroconversion among pregnant and nursing mothers who tested negative for HIV infection at their first presentation at health facilities but later became HIV infected in late pregnancies or during breastfeeding. HIV sero-conversion, a well-known phenomenon in HIV pathogenesis, is the

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change in the HIV infection status from negative (absence of infection) to positive (presence of infection) evidenced by the presence of detectable HIV antibody in the serum of the infected person [7,8]. This can be due either to the lapse of the window period from an old infection or the presence of new infection. Unfortunately, there is no active surveillance put in place for this category of women as most guidelines even in high burden settings do not encourage repeated screenings for HIV infections among this group. Few cases that are picked up as typified by this study were diagnosed because of symptomatic presentations and high index of clinical suspicion, these women and their babies may slip through the PMTCT cascade and constitute a gap in the PMTCT programming. The objective of this study therefore is to raise awareness on seroconversion among ANC clients and to demonstrate the effect on vertical transmission of HIV infection. Studies have shown there is a high HIV seroconversion incidence among women during pregnancy and following delivery [9]. The practice of screening for HIV only once during pregnancy as practiced in some developing countries have also been associated with a missed opportunity to diagnose women who get re-infected and seroconvert during pregnancy [10].

Case Reports

Case 1

Mrs. O.B, a 29 year old house wife, and a tailor by profession. At the point of booking for ANC on the 5th August 2014 at the government hospital, she was a primiparous, gravida one with singleton fetus at estimated gestational age (EGA) of 24 weeks. HIV screening completed on 25th August came out as negative (non-reactive to Determine HIV antibody test kit). She was therefore managed as a HIV negative woman both in ANC and during delivery. She had an uneventful antenatal care and delivered a live male infant (Bt weight-3.25kg, AS- 8, 10) at term on the 11th January 2015 via spontaneous vaginal delivery, 5 months after registration for ANC. The mother however presented at the hospital on the 6th May 2015, about 4 months after delivery with complaints of generalized body itching, generalized swelling, abdominal pain and dizziness. A diagnosis of a hypersensitivity allergic reaction was made and a repeat HIV screening among other laboratory tests was ordered. This second HIV antibody test with Determine and Unigold rapid test kits was positive. A third HIV antibody rapid test which was also positive was conducted at another hospital (tertiary center). The husbands HIV test results however remained negative. Her baseline CD4 count was 174 cells/cm3 while renal function test and lipid profile tests were all within normal range. The patient was subsequently commenced on a combined regimen of Efavirenz (EFV) 600mg + Emtricitabine (FTC) 200mg + Tenofovir (TDF) 300mg (Atripla) and Cotrimoxazole 960mg tablet once daily. The 4th month old exposed infant who was being breastfed was also started on ARV prophylaxis and had HIV antibody rapid test with HIV DNA PCR test done. The HIV PCR result was HIV negative while the antibody rapid test was positive. A repeat confirmatory HIV DNA PCR done 6 weeks after breastfeeding was also negative.

Case 2

Mrs. F.F, a 43 year old trader married in a monogamous setting. She registered for ANC on the 25th of February 2015 at a public hospital when she was 19 weeks gestational age in the 4th pregnancy and parity 3. HIV antibody screening done on the 4th March 2015 was negative for the patient and she was then managed as HIV negative until she was re-tested for HIV on the 8th June 2015, 3 months after the first HIV negative result. She started ARV prophylaxis (Atripla) 3 days later. She had a bout of malaria fever at 35 weeks gestational age and was managed with artemisinin-combined therapy. She delivered a live female neonate at term with a good Apgar score and birth weight of 3.4kg. The delivery was via spontaneous vaginal route and took place on the 9th July 2015; a month after HIV seroconversion and ARV prophylaxis. The baby had Nevirapine prophylaxis and was breastfed exclusively. HIV DNA PCR using DBS was carried out at 6 weeks for the baby and the result was negative.

Case 3

Mrs. O.B, a 30 year old, primiparous who booked at 16 weeks gestational age on January 18th 2012. She was married in a monogamous setting to HIV negative husband. She was screened for HIV infection with rapid antibody test kit (Determine and Unigold) on 14th February 2012 and was found to be HIV seronegative. Follow-up antenatal care visits were without complications and she had an emergency caesarean section on account of fetal distress

on the 16th June 2012 and delivered a live male neonate with a good Apgar score. She had no blood transfusions as blood loss was minimal. She was re-screened 12 months after delivery on the 17th June 2013 and was confirmed HIV seropositive with the same test kits brands. This happened while she was breastfeeding the baby for a year and the baby was already a year old. She was subsequently commenced on ARV prophylaxis (Atripla) the same day, baseline CD4 count was 692cell/m3. Baby's HIV antibody screening was done and it was positive, HIV DNA PCR test was also positive. The infant was subsequently commenced on antiretroviral therapy and enrolled in paediatric HIV care.

Case 4

Mrs. W.M, a 33 year old security personnel, married in a monogamous setting to her colleague. She registered for ANC in a tertiary public hospital on the 26th June 2014 as a mutigravida (Gravida 3,Parity 2) at 22 week gestation with twin fetuses. HIV screening was done the same day and came out as sero-negative (non-reactive to Determine HIV antibody test kit). She was therefore managed as a HIV negative woman both in ANC and during delivery. She had an uncomplicated ante-natal care and delivered a set of twin female & male neonates with good Apgar score at term gestation on 10th October 2014 via caesarean section delivery, about 4 months after booking for ANC. The twins were exclusively breastfed and had no infant morbidity. The mother however was re-screened at the hospital in April 2015 when another 5 year old child of hers was diagnosed HIV infected upon presenting with symptoms suggestive of HIV infection. This time the mother was found to be HIV positive. This happened 9 months after the initial ANC HIV seronegative result. Consequently other members of the family including the two 6 month old twins were screened and both found to be HIV seropositive. A confirmatory HIV PCR tests done for the babies also returned positive for both. The husband however remains HIV negative. Her baseline CD4 count was 621 cells/cm3. The mother was subsequently commenced on 960mg Cotrimoxazole tablet once daily as her CD4 count did not qualify for ART initiation according to the national guideline. The 6 month old infected infants were started on 1st line antiretroviral therapy.

Discussion

Three out of the five babies whose mothers seroconverted were HIV infected as confirmed by HIV DNA PCR test. The four mothers were initially HIV negative during antenatal care but became HIV positive at the second HIV screening. Repeat HIV testing was done in the first case about 9 months after the 1st HIV negative test and 5 months post-partum. Mother had ARV therapy as her CD4 count was below the threshold for ARV initiation, baby was given Nevirapine prophylaxis according to the guideline [2]. The mother continued breastfeeding for another 7 months. Baby had confirmatory HIV PCR test done 6 weeks after breastfeeding cessation and the result was HIV negative. The second case became HIV positive at the repeat HIV screening done 3 months after the initial HIV negative result and was therefore commenced on ARV prophylaxis in pregnancy which she also continued during labour and breastfeeding. The baby also had Nevirapine prophylaxis. This intervention prevented HIV transmission to the baby despite other risks factor like the bout of acute malaria that the mother had and was treated for ante-partum [2]. The 3rd case did not have a repeat HIV test done until 16 months after the ANC HIV seronegative result and 12 months post-partum. Hence neither the baby, who was breastfed, nor the mother had ARV prophylaxis. Unfortunately, the baby became infected with the HIV virus. The mother in the 4th case was diagnosed HIV positive during her second HIV screening done 9 months after the previous ANC HIV seronegative result and 6 months after delivery. Unfortunately, her twin babies who were breastfed without ARV coverage were confirmed to be HIV infected and commenced on ARV therapy. The repeat HIV tests in these women were done based on presenting symptomatology of the mothers or any other sibling and not as a routine protocol for parturients. This implies that other women who may have seroconverted but are not symptomatic would have escaped being diagnosed. Only one of the women seroconverted during antenatal care, the other three seroconverted after delivery while breastfeeding. The woman who seroconverted during ANC had ARV prophylaxis for herself and the baby while the other three that seroconverted months after delivery did not have ARV. The reason this may be so is because the first case booked early in pregnancy at 19

weeks GA and thus still had more than 3 months post-HIV seronegative test before delivery for a repeated test to be done. In the first two cases both the mothers and the babies had ARV prophylaxis and this probably explains why the babies were not HIV infected whereas in the last two cases the babies were breastfed without ARV coverage in either the mother or the babies for 6 to 12 months. Consequently, the three babies from these women became infected with HIV. The shortest interval between the 1st and the repeated HIV screening in these women was 3 months and the longest was 16 months. Though this depends on the time of clinic presentation by the women, yet an active surveillance for women within the MTCT period (ANC, labour & delivery, breastfeeding) would help to reduce this interval. A new protocol of HIV testing in PMTCT that stipulate repeat testing for mothers who tested HIV negative in their early pregnancy at regular intervals of 3 months, 6 months, 12 months and 18 months from ANC booking to the end of breastfeeding as a matter of routine practice is needed. This screening protocol if adopted will ensure that most seroconverted cases among nursing mothers are detected during this risky period of mother to child transmission of HIV. Counselling to promote safe sexual practice should also be intensified among women and their partners during this period. The use of ARV for pre or post-exposure prophylaxis for HIV negative pregnant and nursing mothers is an option that can be considered. HIV antigen screening instead of the HIV antibody screening to reduce the duration of window period can also be promoted especially in low resource settings to improve HIV diagnosis [11,12].

Re-screening for HIV during the course of pregnancy, delivery and breastfeeding is therefore recommended to identify pregnant and nursing mothers who may seroconvert or get newly infected especially during this risky period of mother to child transmission of HIV. A new protocol that stipulates repeat testing for mothers who tested HIV negative in their early pregnancy at regular intervals of 3months, 6 months, 12 months and 18 months from ANC booking to the end of breastfeeding is hereby advocated as a matter of routine practice. Women and their partners should also be counselled to engage in safe sexual practice during this period. Alternatively the use of post-exposure ARV prophylaxis for mothers who become exposed during this period could be considered.

Conflict of Interest

We declare that we have no conflict of interest.

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