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ORIGINAL ARTICLE

Pregnancy Outcomes in Booked HIV Positive Women Initiating Highly Active Antiretroviral Therapy

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Pregnancy outcomes in HIV positive women remain a concern especially in sub-Saharan Africa which bears the highest burden of the disease. To evaluate pregnancy outcomes in booked pregnant women on Highly Active Antiretroviral Therapy (HAART) at the University of Ilorin Teaching Hospital (UITH), Ilorin, Nigeria; a case control study (with women initiating HAART in pregnancy as subjects and those who initiated it before pregnancy as control) of 268 HIV-positive women managed between March 2009 and February 2013 was undertaken at the hospital. Inclusion criteria comprised HIV-positivity, booking, antenatal care and delivery at the study site. From the total of 8,958 women who had antenatal care during the period, 502 had HIV infection (prevalence 5.6%) out of which 268 satisfied the inclusion criteria and were enrolled into the study. Subjects were 54(20.2%) while 214(79.8%) were controls; the mean age of participants was 31.0±4.5 years while mean parity was 2.0±1.5. Pregnancy outcomes were worse in subjects with statistical significance in miscarriage (11.1% vs. 0.9%; OR 11.78, 95% CI 2.07-87.03, p <0.01), preterm delivery (31.5% vs. 1.9%; OR 24.35, 95% CI 7.15-91.26, p<0.01), term pregnancy (42.6% vs. 96.3%; OR 0.03, 95% CI 0.01-0.08, p<0.01), birth asphyxia (OR 8.31, 95% CI 3.25-21.45 p<0.01), low birth weight babies (OR 260.0, 95% CI 66.51-1142.77, p<0.01) and maternal puerperal complications (anaemia 35.2% vs. 0.9%; OR 68.79, 95% CI 14.28-452.19, p <0.01). Mother to child transmission of HIV was recorded in only 3(1.1%) babies among the subjects. Commencement of HAART before pregnancy appears to improve pregnancy outcomes in HIV positive women.

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INTRODUCTION

Curtailing Human Immunodeficiency Virus (HIV) infection has gathered much international attention since it was first reported in 1981 and the number of people living with HIV (PLWHIV) continue to increase in some countries while others reported a decrease; but AIDS-related illnesses remain a leading causes of death worldwide (Monjok *et al.,* 2009). Globally, an estimated 35.3 million PLWHIV, 2.3 million new HIV infections and 1.6 million AIDS deaths were reported in 2012 (UNAIDS 2013). The burden is especially great in sub-Saharan Africa and Nigeria has an estimated 3.19 million PLWHIV in 2011 (Bashorun *et al.,* 2014). Generally, reports from developed countries showed that HIV has little effect on pregnancy outcomes while reports from developing countries showed adverse outcomes like miscarriages, low birth weight, intrauterine growth restriction, stillbirth and preterm delivery (Onakewhor, 2004).

Contributing factors may include limited HIV counselling and testing, poor access to antiretroviral drugs and inadequate trained health workers to identify women who need treatment, initiate and monitor treatment in pregnancy (McIntyre, 2003). However, little is known of the impact of Highly Active Antiretroviral Therapy (HAART) on pregnancy outcome among antenatal women in North Central Nigeria. This study was therefore carried out to determine pregnancy out-

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comes in booked pregnant women who initiated Highly Active Antiretroviral Therapy (HAART) during pregnancy (subjects) compared to those who initiated it before pregnancy (controls).

MATERIALS AND METHODS

Setting

The study was conducted at the Prevention of Mother-to-Child Transmission of HIV (PMTCT) clinic of the University of Ilorin Teaching Hospital (UITH), Ilorin, Nigeria. Activities conducted at the clinic include pre- and post-test counselling, testing (rapid tests and enzyme linked immunosorbent assay [ELISA]), couple's HIV counselling and testing, adherence counselling and distribution of prescribed drugs.

Study Design

This case control review of the pregnancy outcomes was conducted among HIV-positive women who had antenatal care at UITH from March 2009 to February 2013. The inclusion criteria were HIV positivity, antenatal care, use of HAART and delivery at the study site. Women with HIV infection who were not booked, did not use HAART or delivered at other facilities and HIV negative women reporting to the study site were excluded from the study. A total of 502 HIV positive women were managed during the study period among these, 268 were recruited into the study. Subjects were women who initiated HAART during pregnancy (54 i.e.20.4%) while controls were women who initiated HAART before pregnancy (214 i.e. 79.8%).

Data collection, procedure and analysis

All pregnant women with HIV positivity following testing, initiated HAART before or during the index pregnancy and satisfied the inclusion criteria were identified from clinic and labour ward records; the case files were retrieved and relevant data extracted. Data of interest included age, parity (number of pregnancies carried to viability i.e.≥28 weeks gestation irrespective of the outcome), number of children alive at the time of the evaluation, marital status, educational status, employment status, religion, time of diagnosis of HIV and commencement of HAART, gestational age at booking, pregnancy outcome, puerperal complications and neonatal outcome. The results of the neonatal screening were obtained from the child follow-up register. The data collected was represented in tables, test of significance was by t-test and odds ratio with 95% confidence interval; P-value < 0.05 was taken as significant.

RESULTS

During the study period, 8,958 clients were booked for antenatal care; 502 were HIV-positive (5.6%); however, only 268 satisfied the inclusion criteria and were included in the study. The mean age of

Table 1: Bio-social characteristics of participants

Variables	n(%)
Age	
15-19	5(1.9)
20-24	16(6.0)
25-29	68(25.4)
30-34	117(43.7)
35-39	59(22.0)
40-44	3(1.1)
Mean age	31.0±4.5*
Marital status	
Single	3(1.1)
Married	265(98.9)
Level of education	
None	13(4.9)
Primary	44(16.4)
Secondary	98(36.6)
Tertiary	113(42.2)
Employment status	
Unemployed	41(15.3)
Employed	227(84.7)
Parity	
0	48(17.9)
1-4	199(74.3)
≥5	21(7.8)
Mean	2.0±1.5*
Number of child(ren) alive	
0	57(21.3)
1-4	207(77.2)
≥5	4(1.5)
Mean	2.0±1.0*

***mean±standard deviation**

the study participants was 31.0 ± 4.5 years (range 16-42 years) with a modal age group of 30-34 years (43.7%). Also, 5(1.9%) were teenagers, 265(98.9%) were married, 211(78.7%) had at least secondary school education, 41(15.3%) were unemployed; the mean parity was 2.0 ± 1.5 with a range of 0 to 6 while mean number of children alive is 2.0±1.0 (Table 1).

In Table 2, 214(79.8%) had been on HAART before pregnancy while 54(20.2%) were diagnosed and commenced HAART during pregnancy. Among those initiating HAART during pregnancy, 19(7.1%) commenced it in first trimester, 26(9.7%) in the second and 9(3.4%) in the third trimester.

Table 2: Period of commencement of HAART by the participants

Commencement of HAART	n(%)
Before pregnancy (years)	
<1	28(10.4)
1 – 3	101(37.7)
>3 – 5	61(22.7)
≥5	24(9.0)
During pregnancy	
First trimester	19(7.1)
Second trimester	26(9.7)
Third trimester	9(3.4)

From Table 3, the obstetric outcomes among women who started HAART during (subjects) and before (controls) pregnancy showed statistical significance in miscarriage (11.1% vs. 0.9%; OR 11.78, 95%CI 2.07-87.03; p <0.01), preterm delivery (31.5% vs. 1.9%, OR 24.35, 95%CI 7.15-91.26, p<0.01), term pregnancy (42.6% vs. 96.3%; OR 0.03, 95%CI 0.01-0.08, p<0.01), birth asphyxia (OR8.31, 95% CI 3.25-21.45 p<0.01), low birth weight babies (OR 260.0, 95%CI 66.51-1142.77, p<0.01) and maternal puerperal complications (anaemia 35.2% vs. 0.9%; OR68.79, 95% CI 14.28-452.19, p <0.01). Two hundred and six women (76.9%) had vaginal deliveries, 54(20.1%) had caesarean delivery (33 emergency and 21 elective) while 8(3.0%) had miscarriages. The two commonest indications for elective caesarean delivery were two previous caesarean deliveries and PMTCT while cephalopelvic disproportion was commonest for emergency cases.

From Table 4, vertical transmission of HIV occurred in three babies (1.1%); their mothers were newly diagnosed during the index pregnancy, booked in third trimester, were anaemic at booking and all were delivered vaginally.

DISCUSSION

In Nigeria, the prevalence of HIV gradually increased from 1.8% in 1991 to 4.1% in 2010 (NACA 2012). The 5.6% prevalence in this study is comparable to reports of 5.2% in Benin City (Imade *et al.,* 2010), 5.4% in Abakaliki (Obi, 2005), 5.93% in Port -Harcourt (Obi *et al.,* 2007) all in Nigeria and 6.2% in Addis Ababa (Mirkuzies *et al.,* 2010) but lower than 8.2% in Jos (Obi *et al.,* 2007) and 10.5% in Nnewi (Akabuike *et al.,* 2010) in Nigeria. The variations may be a reflection of the differences in sexual practices and behaviour, awareness of HIV infection and testing, socio-cultural practices and accessibility to healthcare. This rising prevalence among pregnant women poses particular risk to the foetus, the neonate and health workers especially during delivery. Majority of the participants were of reproductive age group as in other studies; although the women were older than reports from Nnewi (Akabuike *et al.,* 2010) and Abakaliki (Obi, 2005) in Nigeria. The preponderance in women of reproductive age may be a reflection of their sexual activities.

The high literacy rate and low parity was similar to reports from Nnewi, South-eastern Nigeria (Akabuike *et al.,* 2010) and may be due to better information about HIV and health seeking behaviour among literate women. The pregnancy outcome in HIV infection remains skewed with poor outcome reported mainly from developing countries. Townsend *et al.,* (2007) reported 14.1% preterm delivery rate in the UK, Ahmadu *et al.,* (2013) reported LBW rate of 22.2% in Maiduguri while Akabuike *et al.,* (2010) reported 21.6% in Nnewi, Nigeria. Aniji *et al.,* (2013) reported no difference in preterm delivery and LBW while Patel *et al.,* (2010)

Table 3: Relationship of pregnancy outcome and the period of commencement of HAART

Variables	During pregnancy (n=54)	Before pregnancy (n=214)	$\chi 2$	P value	OR	95% CI
Obstetric outcome						
Miscarriage	6(11.1%)	2(0.9%)	10.58	<0.01	11.78	2.07 - 87.03
Preterm delivery	17(31.5%)	4(1.9%)	48.82	<0.01	24.35	7.15 - 91.26
IUFD	6(11.1%)	0(0.0%)	19.51	<0.01	-	-
Term pregnancy	23(42.6%)	206(96.3%)	99.88	<0.01	0.03	0.01 - 0.08
Post term	2(3.7%)	2(0.9%)	0.69	0.19	3.93	0.38 - 40.07
Neonatal outcome						
Mild birth asphyxia	15(27.8%)	11(5.1%)	26.71	<0.01	8.31	3.25 - 21.45
Severe birth asphyxia	11(20.4%)	0(0.0%)	45.23	<0.01	-	-
No asphyxia	22(40.7%)	201(93.9%)	76.92	<0.01	0.05	0.02 - 0.11
Birth weight						
<2500 g	40(74.1%)	4(1.9%)	184.67	0.01	260.0	66.51-1142.77
≥2500 g	8(14.8%)	208(97.2%)				
Puerperal complication						
Anaemia	19(35.2%)	2(0.9%)	73.59	<0.01	68.79	14.28-452.19
Rupture of membrane	6(11.1%)	2(0.9%)	13.87	<0.01	15.00	2.61-111.71
Sepsis	3(5.6%)	0(0.0%)	8.40	0.01	-	-
Psychosis	3(5.6%)	0(0.0%)	8.40	0.01	-	-

Table 4: Maternal characteristics of babies with vertical transmission of HIV

Maternal Characteristics	Baby 1	Baby 2	Baby 3
GA at booking (weeks)	33	34	36
PCV at booking	22%	22%	23%
GA on starting HAART (weeks)	33	34	36
Duration of use of HAART (weeks)	1	3	2
GA at delivery (weeks)	34	37	38
Mode of delivery	Vaginal	Vaginal	Vaginal
Feeding option	Exclusive Breast-milk	Mixed-feeding	Mixed-feeding

reported no difference in preterm delivery in pre and post conception commencement of antiretroviral. However, Thorne *et al.,* 2004 and Olagbuji *et al.,* (2010) reported increased risk of preterm delivery among women who started antiretroviral preconception. This study however, reported significantly higher cases of miscarriage, preterm delivery, low birth weight and birth asphyxia with lower term pregnancy rate among women who commenced HAART during pregnancy compared to those who started preconception. This difference may be because all women in the study diagnosed preconception were on HAART such that it could have reduced the viral load significantly before conception unlike the possible viraemia in the newly diagnosed antiretroviral naïve women although the viral load

was not determined in this study.

The point estimate of caesarean delivery rate of 20.8% (elective 38.9%; emergency 61.1%) was lower than the 49% (elective 73%; emergency 27%) in Toronto, Canada by Mark *et al.,* (2012). The difference may be due to the aversion for caesarean delivery in developing countries unlike the wide acceptance in the developed ones with many procedures performed on patients' requests. Although, it was initially advocated that elective caesarean delivery reduces MTCT; this has been shown to be insignificant when adjusted for HAART use (European Collaboration Study 2005).Warszawski *et al.,* (2008) reported that HAART is the standard care for treatment of HIV in pregnancy with transmission rate around 1%; the transmission rate of 1.1% in this study corroborates this. In a trial in Kenya, 4.2% of the babies were tested HIV-positive at six months (Thomas *et al.,* 2011); the higher rate could be because the trial involved the commencement of HAART from 34-36 weeks gestation to six months post-partum. For the cases of MTCT in this study, the mothers booked late (third trimester), were anaemic at booking, commenced HAART at 33, 34 and 36 weeks and delivered at 34, 37 and 38 weeks respectively after less than four weeks on HAART; two of the babies had mixed feeding. Maternal postpartum complication was 13.5% in this study lower than 25.2% reported by Akabuike et al., (2010).

CONCLUSION

This study suggests that commencement of HAART preconception offers better pregnancy outcome compared to initiation post conception.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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