

## **AN AUDIT OF THE UPTAKE OF KEY PMTCT INTERVENTIONS IN THE PRE AND POST WHO RAPID ADVICE PERIODS AT THE UNIVERSITY COLLEGE HOSPITAL, IBADAN**

**<sup>1</sup>Olubukola A. Adesina, <sup>2</sup>Modupe A. Kuti, <sup>3</sup>Ogunbosi Babatunde, <sup>4</sup>Odun J. Akinyemi, <sup>5</sup>Adetona Fayemiwo, <sup>1</sup>Olutosin A. Awolude, <sup>1</sup>Isaac F. Adewole**

<sup>1</sup>*Department of Obstetrics & Gynaecology, College Of Medicine, University Of Ibadan, Ibadan.*

<sup>2</sup>*Department of Chemical Pathology, College Of Medicine, University Of Ibadan, Ibadan.*

<sup>3</sup>*Department of Paediatrics, College Of Medicine, University Of Ibadan, Ibadan.*

<sup>4</sup>*Department of Epidemiology & Medical Statistics, College Of Medicine, University Of Ibadan, Ibadan.*

<sup>5</sup>*Department of Medical Microbiology, College Of Medicine, University Of Ibadan, Ibadan.*

### **ABSTRACT**

Prevention of vertical transmission of HIV may require the uptake of the culturally unacceptable options of cesarean delivery and formula feeding. The successful use of HAART, as enumerated by the WHO 2009 rapid advice, has the potential for facilitating the uptake of the more culturally acceptable vaginal delivery and breast feeding. These recommendations became operational at the PMTCT unit, University College Hospital, Ibadan. This retrospective study describes the impact of these recommendations on the uptake of PMTCT interventions at our center.

The pre-rapid advice period was June 2009 to April 2011 and the post rapid period May 2011 till December 2012. Pre-rapid advise, antiretrovirals administered was zidovudine or Combivir for women with CD4 >200cells / ml and Combivir/nevirapine for CD4 <200 Cells/ ml. Post-rapid, all were eligible for HAART (mostly efavirenz/ truvada or efavirenz/ Combivir). Six weeks post-natally, the options adopted were documented and are presented here.

Information from 1165 women was available. Thirty three (2.8%) did not have adequate information and were excluded. There were 711 women pre-rapid advise and 421 women post rapid. The women's characteristics were not significantly different over both periods, 69.0% had >6 years of education, 97.0% were married and slightly over half (56.9%) were involved with traders. Overall, more women were delivered by the vaginal route than Caesarean Delivery (70.5% vs. 29.5%), while more breastfed compared to formula feeding (67.2% vs. 32.8%).

In the post rapid period (compared to the pre- rapid) advise, more women had vaginal delivery (73.5% vs. 64.8%,  $p = 0.54$ ), more women breast-fed (77.0% vs. 50.1%,  $p = 0.00$ ) and fewer women used contraception (21.5% vs. 27.3%,  $p = 0.023$ ). The commonest method was the condom (83.4%).

The new WHO guidelines appear to have facilitated a shift in uptake of the more culturally acceptable options of vaginal delivery and breast feeding. A follow-up evaluation of the infant HIV status will ascertain the ultimate impact on MTCT.

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**Correspondence: Dr Olubukola A. Adesina**

Dept Of Obstetrics & Gynaecology, College Of Medicine, University Of Ibadan, Ibadan.

Phone No- 234-909-909 3024

E - Mail: Bukiadewole@Gmail.Com,

Bukiadewole@Hotmail.Com

## INTRODUCTION

The World Health Organisation promotes a comprehensive strategic approach for the prevention of vertical transmission of the Human Immunodeficiency Virus, consisting of four components<sup>1</sup>: (1) Primary prevention of HIV infection; (2) Prevention of unintended pregnancies among women living with HIV; (3) Prevention of HIV transmission from mothers living with HIV to their infants (PMTCT); (4) Care, treatment and support for mothers living with HIV, their children and families. The third component i.e. prevention of mother-to-child transmission of HIV (PMTCT) can be achieved through the use of Anti retroviral (ARV) drugs in pregnancy, choosing safer interventions of delivery, neonatal Anti-Retroviral prophylaxis and safer infant feeding practices. A combination of these successful interventions can reduce the risk of MTCT to less than 2%<sup>2</sup>.

These interventions are associated with varying impact on the rates of reduction of MTCT of HIV. These include 60% MTCT reduction with zidovudine among non-breastfeeding women in the USA and Europe<sup>3</sup>, less than 2% transmission with HAART<sup>4</sup> and 11.8% transmission in a breast feeding population demonstrated in the HIVNET 012 trial using nevirapine in Uganda<sup>5</sup>. The use of elective cesarean section (ELCS) prior to the onset of labor can reduce the rate of MTCT by about 50%<sup>6</sup>. Despite the ready availability of breast milk and its protective nature against common childhood illnesses, it contributes about 30-50% of the MTCT of HIV<sup>7,8</sup> and so various authorities advise the avoidance of breastfeeding altogether<sup>2</sup>. Feeding of the HIV-exposed infant in a culture where a high premium is placed on breast-feeding is therefore a great challenge. Finally, the prevention of unintended pregnancies among HIV-infected women will not only lengthen birth intervals, it will also reduce the number of HIV-infected infants and number of

orphans<sup>9</sup>.

Despite the obvious benefits of these interventions, uptake is however associated with challenges. For example, there is an aversion of Nigerian women towards cesarean section<sup>10</sup> and the use of replacement feeding in communities where breastfeeding is the norm may not be culturally acceptable with resultant stigmatization and negative repercussions<sup>11</sup>. However, an aggressive reduction in viral load antenatally and in the breast feeding periods may allow the more culturally acceptable options of vaginal delivery and breast feeding to be practiced<sup>12,13</sup>. The use of HAART to achieve such reduction in viral load and prevent in utero, intra-partum and breast feeding mother-to-child transmission of HIV was briefly enumerated by the WHO 2009 rapid advice (*use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants*)<sup>14</sup> and further elaborations made in the 2010 WHO revised PMTCT recommendations. As previously noted, these recommendations have the potential for allowing the women to make more culturally acceptable choices while ensuring a sustained reduction in vertical transmission of HIV.

These recommendations became operational at our centre in April 2011. The objective of this audit was to describe the impact if any of the WHO rapid advice on the pattern of uptake of key PMTCT interventions by HIV positive pregnant women accessing care at the PMTCT unit of the University College Hospital, Ibadan. The pattern before and after implementation of these recommendations are presented here.

## METHODOLOGY

This audit was conducted at the PMTCT unit of the Antiretroviral clinic of the University College Hospital, Ibadan. The University College Hospital (UCH), one of the largest hospitals in Nigeria, is a

tertiary health facility situated in Ibadan, South Western Nigeria. The PMTCT program is supported by the AIDS Prevention Initiative in Nigeria (APIN) and the Harvard partnered President's Emergency Plan for AIDS Relief (PEPFAR) program. The PMTCT program involves HIV testing and counselling for all women presenting for antenatal care and during labour for those not previously tested. HIV screening is carried out with rapid kits and confirmation by Western Blot. For this study, the pre-rapid advice period was June 2009 to April 2011 and the post rapid advice period was May 2011 till December 2012.

In the pre-rapid advice period, antiretrovirals administered was mostly zidovudine or Combivir for women with CD4 >200 cells / ml and Combivir with nevirapine for women with CD4 <200 Cells/ ml. Women who were not eligible for HAART stopped ARV after delivery, while the babies continued on ARV prophylaxis. All women then had to make a choice between formula feeding and breastfeeding. In the post rapid advice period, all women were eligible for HAART mostly efavirenz with truvada or efavirenz with Combivir antenatally. In the postpartum period, even women who were not eligible for HAART for their clinical condition but chose to breastfeed could continue on HAART in a bid to keep the viral load down and reduce the risk of breast milk HIV transmission. As part of the care program, counselling sessions by the PMTCT counselors for the HIV positive pregnant women accessing care at the PMTCT clinic in both periods reflected these ARV options that were available. Other key PMTCT interventions that the women received counseling on included the contribution of the various modes of delivery to MTCT, the pros and cons of the various infant feeding options and the benefits of accessing a modern method of family planning.

At the six weeks postnatal visit, in the process of

identifying and addressing challenges being experienced by these women, the options adopted by these women are documented in a register. The results from that register are presented here. Data was entered and analysed using Statistical Package for Social Sciences (SPSS Inc, Chicago, Ill, version 15). Frequency tables were constructed and means ( $\pm$  standard deviation) calculated. In addition, comparison of quantitative and qualitative data was done using students't-test and chi-square respectively.

## RESULTS

During this period, information from one thousand, one hundred and sixty five (1165) women was entered into the register. Thirty three (2.8%) did not have adequate information and were excluded from further analysis. There were seven hundred and eleven (711, 62.8%) women in the pre-rapid period while four hundred and twenty one (421, 37.2%) women were seen in the post rapid period.

Table 1 shows the socio-demographic characteristics of these women. The mean age of women in the pre-rapid and post rapid advice periods were not statistically different ( $31.09 \pm 4.54$  vs  $31.24 \pm 4.77$ ;  $p=0.38$ ). Overall, while about half (51.1%) of the women were in the para 2-4 group, over half (69.0%) had more than 6 years of education. Almost all (97.0%) were married and slightly over half (56.9%) were involved with buying and selling (trading). There were no significant differences in these selected maternal socio-demographic characteristics when women were compared from both periods.

Table 2 shows the key PMTCT interventions chosen by these women. Overall, more women were delivered by the vaginal route (70.5%). Compared to the pre-rapid advice period, more women chose vaginal delivery in the post rapid period (64.8% vs 73.5%), although the difference was not statistically

significant (  $p$  value = 0.054). In addition, more women (67.2%) chose breastfeeding in this cohort. However, while the infant feeding options were almost equally split in the pre-rapid advice period, significantly more women chose breast feeding after the rapid advice was implemented (50.1% vs 77.0%;  $p$  value 0.00 ). Only about a quarter of the women were on any mode of contraception. In comparison, the proportion of women on contraception was lower in the post rapid advice period (27.3% vs 21.5%). The difference was statistically significant (0.023). The commonest family planning method being utilized was the condom (83.4%).

## **DISCUSSION**

More women chose vaginal delivery compared to caesarean delivery in this cohort. This finding is similar to that of Ibeziako et al ( 2012) working in south east Nigeria who reported 12.4% caesarean delivery and 87.1% vaginal delivery. It is however different from the findings of Goswami and Chakravorty working in India who reported 49.51% caesarean delivery and 50.48% vaginal delivery <sup>15</sup>. When a mother is HIV positive, an elective caesarean section may be done to protect the baby from direct contact with her blood and other body fluids. Caesarean delivery however, is not favored in most Nigerian communities and is associated with stigma in the general population <sup>10</sup>. Oladokun et al in their 5 year (2002- 2007) review of PMTCT uptake at the University College Hospital, Ibadan noted that the rate of elective caesarean delivery for PMTCT remained low over the years they studied. This was in spite of the free caesarean delivery service which the Federal Government of Nigeria provided for HIV positive pregnant women. However, if the mother is taking combination antiretroviral therapy then a caesarean section may not be necessary because the risk of HIV transmission will already be very low. <sup>15</sup>. The introduction of HAART for all HIV positive

pregnant women at our center in the post rapid advice period may thus explain the higher proportion of the culturally more acceptable vaginal delivery in that period.

The infant feeding options chosen by this cohort in the pre-rapid advice period was almost equally divided between breast feeding and formula feeding. In the post rapid advice period however, more women chose to breast feed (77.0% vs 50.1%,  $p=0.00$ ). This is different from the findings of Goswami and Chakravorty working in India who reported 29.47% breast feeding and 70.53% formula feeding <sup>15</sup>. In a similar manner, Ibeziako et al ( 2012) working in south east Nigeria reported 12.3% exclusive breast feeding, 79.8% formula feeding and 7.9% mixed feeding <sup>2</sup>. An evaluation of PMTCT activities at our centre in earlier years by Oladokun et al (2010) reported 85.8% mothers practiced formula feeding, 1.5% practiced mixed feeding and the remaining 12.6% breast fed <sup>8</sup>. It must however be noted that these studies were done when the ARV prophylaxis consisted of either single dose nevirapine, AZT or CBV with HAART being reserved only for women with advanced disease. With the implementation of the rapid advice at our centre, more women chose to breast feed.

Approximately 200,000 infants worldwide become infected annually with human immunodeficiency virus type 1 (HIV-1) through breast-feeding <sup>16</sup>. The Nigerian national recommendation on infant feeding in the context of HIV infection, states that "when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended <sup>8</sup>. Otherwise, exclusive breastfeeding is recommended during the first months of life" <sup>17</sup>. These feeding guidelines are particularly challenging in communities where breastfeeding is the norm as obtained in Nigeria <sup>18,19</sup>.

Replacement feeding prevents breast milk transmission of HIV but is associated with drawbacks in resource-poor settings. These include its cost<sup>20</sup>, the risk of death from diarrhoea and malnutrition<sup>21</sup> and social issues including stigmatisation and suspicion<sup>8</sup>. Breastfeeding on the other hand has been consistently shown to reduce infant and child morbidity and mortality<sup>21</sup>. Thus, exclusive breast-feeding is recommended by the World Health Organization (WHO) for infants of HIV-1-positive women for at least 12 months of life with the proviso that more extended prophylaxis be administered to mothers and / or infants in resource-limited settings<sup>22</sup>. The introduction of the WHO rapid advise in our center facilitated the provision of these regimen to the mother-infant pairs and the choice of the more culturally acceptable option of breast feeding.

Care providers in centers where the rapid advise recommendations are being implemented must identify areas in which to intensify counseling in order to meet the cultural needs of their patients and prevent stigmatization<sup>8</sup>. To provide effective care and support for HIV-positive mothers and their infants, they need to understand the advantages and potential side effects associated with providing maternal HAART for MTCT and the extended infant prophylaxis. While the maternal regimen has the dual advantages of protecting the infant and maintaining maternal health,<sup>23</sup> the extended infant prophylaxis with nevirapine is low-cost, daily dosed with manageable toxic effects<sup>23</sup>. Its potential for resistance is minimized, since only a small proportion of infants receiving prophylaxis would become infected<sup>23</sup>. On the other hand, it must be noted that treatment interruption or poor adherence by the mother may increase the risk of resistant HIV-1 strains and restrict the mother's future treatment options<sup>24</sup>. Furthermore, the maternal triple-drug regimen is costly, requires laboratory monitoring<sup>25</sup>

and resistance may also occur in infants who become infected while their mothers are receiving the triple-drug regimen<sup>26,27</sup>.

Overall, just about a quarter (25.2%) of all the women studied were utilizing any form of contraception. This is much lower than rates reported by various workers. These include 80% reported by Kaida et al working in South Africa<sup>28</sup>, 51.8% reported by Wanyenze in Uganda<sup>29</sup>, 50.6% reported by Ezechi in Lagos Nigeria<sup>30</sup> and 81.1% reported by Enyindah & Enaohwo in Port-Harcourt also in Nigeria<sup>31</sup>. All of these workers reported condoms as being the commonest mode of contraception in the populations they studied. It must be noted that while all these workers studied the general HIV positive female population in the various sites where they worked, our study focused specifically on the postpartum women at the 6<sup>th</sup> postnatal visit.

The prevention of unintended pregnancies among HIV-infected women is recognized as a critical, cost-effective strategy in the prevention of mother-to-child transmission. However, it is widely underutilized<sup>32-34</sup>. It has been shown that a PMTCT strategy focused on increasing contraception among HIV-positive women could avert 29% more HIV-positive births than prophylactic nevirapine alone, at the same level of expenditure<sup>32</sup>. However, the prevailing under-emphasis of reproductive health within HIV programmes remains evident in the numbers: unwanted fertility among women living with HIV is estimated to account for 25% of infant infections (nearly 90,000 MTCT incidences every year) and 20% of infant mortality<sup>35</sup>. Additional benefits of family planning among HIV-infected women include reductions in the familial consequences of maternal illness, death or both<sup>28</sup>.

Most HIV-infected women can use many modern contraceptive methods safely. The WHO Medical Eligibility Criteria for Contraceptive Use (WHO

MEC) do not place restrictions on the use of hormonal methods. on the basis of HIV infection, although special consideration may be needed for women taking antiretroviral (ARV) drugs<sup>36</sup>. The effectiveness of some hormonal contraceptives may be reduced due to interaction with antiretroviral drugs<sup>29</sup>. Intrauterine devices (IUDs) are also considered safe for HIV-infected women and women with AIDS who are clinically well on antiretroviral therapy (ART)<sup>36</sup>.

The correct and consistent use of condoms can be an effective method to prevent pregnancy (estimated failure rate of 2%)<sup>37</sup>, and reduce the transmission of HIV and other sexually transmitted infections (STIs)<sup>9,29</sup>. However, condoms, as typically used, are not as effective in preventing pregnancy as permanent methods, hormonal methods or IUDs<sup>28,37</sup>. Thus, it is preferable for HIV infected women wishing to avoid pregnancy to consider using a more effective method of contraception in combination with condoms to provide dual protection against both unintended pregnancy and STI/ HIV transmission/acquisition<sup>9</sup>. Limitations of this study include the fact that the effects of some determinants of the uptake of these key PMTCT interventions were not studied. These include issues such as average duration of ARV use, previous contraceptive experience, duration since diagnosis of HIV. This may however be the focus of another study.

In conclusion, the provision of maternal HAART for MTCT of HIV and extended infant prophylaxis with the introduction of the new WHO guidelines appears to have facilitated the choice of the more culturally acceptable options of vaginal delivery and breastfeeding. There was however a reduction in uptake of contraceptive methods, indicating a need for a stronger reproductive health component to the PMTCT program. Finally, a follow-up evaluation of

the infant HIV status will be necessary to ascertain the ultimate impact on MTC

**Table 1:** Selected Maternal Socio-Demographic Characteristics

Variable	All women n=1132	pre-Rapid n= 711	post-Rapid n=421	p value
<b>Mean age (± S.D)</b>	31.21± 4.69	31.09 ± 4.54	31.24±4.77 (95%C.I:10.79-0.48)	0.38
<b>Parity</b>				
Para 0	217 (19.2%)	130 (18.3%)	87 (20.7%)	0.144
Para 1	288 (25.4%)	212 (29.8%)	76(18.1%)	
Para 2-4	578 (51.1%)	341 (48.0%)	237 (56.3%)	
Para = 5	49 (4.3%)	28 (3.9%)	21(4.9%)	
<b>Level of education</b>				
No schooling	52(4.6%)	33(4.6%)	19(4.5%)	0.388
Primary	237(20.9%)	134(18.8%)	103(24.5%)	
Secondary	499(44.1%)	304(42.9%)	195(46.3%)	
Diploma	62(5.5%)	57(8.0%)	5(1.2%)	
Tertiary	282(24.9%)	183(25.7%)	99(23.5%)	
<b>Marital status</b>				
Married	1107 (97.0%)	702 (98.7%)	405 (96.2%)	0.183
Single	25 (2.2%)	9(1.3%)	16 (3.8%)	
<b>Occupation</b>				
Artisan	189(16.7%)	97 (13.7%)	92 (21.8%)	0.749
Trading	644 (56.9%)	414 (58.2%)	230 (54.6%)	
Civil servant / teaching	137 (12.1%)	84 (11.8%)	53 (12.6%)	
Professional	24 (2.1%)	16 (2.3%)	8 (1.9%)	
Housewife	38 (3.4%)	26(3.6%)	12 (2.9%)	
Student / Youth Corper	68 (6.0%)	49(6.9%)	19 (4.5%)	
Low-skilled	32 (2.8%)	25(3.5%)	7 (1.7%)	

**Table 2-** Key PMTCT Interventions

Variable	All women n=1132	pre-Rapid n= 711	post-Rapid n=421	p value
<b>Mode of delivery</b>				
Vaginal delivery	798 (70.5%)	461 (64.8%)	309(73.5%)	0.054
Caesarean delivery	334 (29.5%)	250 (35.2%)	112(26.5%)	
<b>Infant feed option</b>				
Breast feed	761(67.2%)	356 (50.1%)	324(77.0%)	0.00
Formula feed	371 (32.8%)	355(49.9%)	97 (23.0%)	
<b>On a method of contraception</b>				
Yes	285(25.2%)	194 (27.3%)	91(21.5%)	0.023
No	847 (74.8%)	517(72.7%)	330(78.5%)	
<b>Method being utilized</b>				
Barrier	238 (83.4%)	165(85.1%)	73(80.6%)	0.313
COC	3(1.0%)	0 (0.0%)	3(3.3%)	
Implant	11 (3.9%)	6(3.1%)	5(5.4%)	
Injectable	19(6.8%)	11(5.7%)	8(8.9%)	
Sterilization	14(4.9%)	12 (6.1%)	2(6.9%)	

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