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Whitfield, T*; Dessain, A; Taylor, K; McQuillan, Q; Looi, E; Kingston, M; Ajdukiewicz, K (Manchester, UK) 

P167  Severe birth defects in children perinatal exposed to HIV from a “real world” setting - Infectious Diseases National  
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Tudor, A* (Bucharest, Romania) 

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Romania  
Mardarescu, M*; Cibea, A; Petre, C; Neagu-Draghiceanou, R; Ungurianu, R; Petrea, S; Tudor, A;  
Vlad, D; Matei, C; Alexandra, M (Bucharest, Romania) 

P170  Possible association between the stage of HIV disease, antiretroviral treatment and the nutrient composition of breast  
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van den Heever, W*; de Wet, G; Hattingh, M (Boemfontein, South Africa) 

P171  The spectrum of HIV mother-to-child transmission risk  
Reliquet, V*; Winer, N; Chereau, N; Launay, E; Lamberet, A; Andre-Garnier, E; Raffi, F; Brunet, C (Nantes, France) 

P172  Transmitted drug resistance in women with intrapartum HIV-1 diagnosis: a pilot epidemiological survey in Buenos Aires,  
Argentina  
Cecchini, D*; Zapiola, I; Fernandez Giuliani, S; Martinez, M; Rodriguez, C; Bouzas, M (Buenos Aires, Argentina) 

P173  Prevention of mother-to-child transmission - experience of a Portuguese center  
Pitieiro, C; Fernandes, S; Figueiredo, C; Santos, A; Moucho, M; Serrão, P*; Montenegro, N; Sarmento, A (Porto, Portugal) 

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Pregnancy outcomes in women growing up with perinatally acquired HIV in the UK & Ireland

Laura Byrne1, Claire Thorne1, Caroline Foster2 and Pat Tookey1

1National Study of HIV in Pregnancy & Childhood, UCL Institute of Child Health, London WC1N 1EH
2Imperial College Healthcare NHS Trust

Background

The first generation of children surviving the HIV epidemic have grown up to adulthood. In addition, there are 2.1 million adolescents aged 10–19 years living with HIV worldwide. Children, adolescents and young adults living with perinatally-acquired HIV (PHIV) have a high risk of treatment failure and multidrug resistance for many reasons: previous exposure to obsolete and suboptimal antiretroviral therapy (ART), the limited range of ART licensed for use in childhood, and difficulties with adherence because of stigma, discrimination, and HIV-associated neurocognitive deficits, among others.

In the UK ~1400 pregnancies are reported in women living with HIV each year, and MTCT declines to 0.5% in 2010.

Studies of pregnancy and reproductive health in women with PHIV in the US have shown lower pregnancy incidence than HIV-negative women, and higher viral loads in pregnancy compared to women with sexually-acquired HIV. A small qualitative study of young people with PHIV in the UK showed a high rate of prenatal intent, likely reflecting perceived benefits in HIV treatment and the risk of MTCT.

However, there is still a paucity of data on the pregnancy incidence and outcomes in this unique and high-risk group of young women.

Results

775 female children with PHIV (diagnosed before their 14th birthday & aged ≥13 during the study period) were reported.

44 (6%) women went on to have at least one pregnancy reported to the study. There were 20 second pregnancies, three third pregnancies and one fourth pregnancy (68 pregnancies in total).

The estimated incidence rate of first pregnancy in this group of women with PHIV was 1.3 per 100 woman-years.

Median age at diagnosis for women who had a pregnancy reported was 5 years (IQR 2, 11) and median age at conception for first reported pregnancy was 19 years (IQR 17, 25). Figure 1 shows the year of birth for women with at least one reported pregnancy, and year of conception for all reported pregnancies in these women.

Median gestation at booking appointment was 11 weeks (range 4 to 23 weeks) (1768 data missing).

See Table 1 for further maternal characteristics, Table 2 for geographical area pregnancy was reported from; and Table 3 for outcomes of the 68 pregnancies reported.

Fig 1: Year of birth and year of conception for women with PHIV

Table 1. Characteristics of 44 women living with PHIV with ≥2 pregnancy reported

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Black African</td>
<td>25</td>
</tr>
<tr>
<td>White</td>
<td>57</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
</tr>
<tr>
<td>Region of birth</td>
<td></td>
</tr>
<tr>
<td>UK/Ireland</td>
<td>36</td>
</tr>
<tr>
<td>Africa</td>
<td>21</td>
</tr>
<tr>
<td>Elsewhere</td>
<td>1</td>
</tr>
<tr>
<td>CD4 ≤200 in first pregnancy (cells/µL) (#/n=37)</td>
<td></td>
</tr>
<tr>
<td>&gt;200</td>
<td>14</td>
</tr>
<tr>
<td>200-399</td>
<td>16</td>
</tr>
<tr>
<td>300-499</td>
<td>12</td>
</tr>
<tr>
<td>≥500</td>
<td>29</td>
</tr>
</tbody>
</table>

Table 2. Area of UK/Ireland pregnancy reported from

<table>
<thead>
<tr>
<th>Area</th>
<th>Number of pregnancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>London</td>
<td>27</td>
</tr>
<tr>
<td>Rest of England</td>
<td>54</td>
</tr>
<tr>
<td>Wales</td>
<td>6</td>
</tr>
<tr>
<td>Scotland</td>
<td>4</td>
</tr>
<tr>
<td>Ireland</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
</tr>
</tbody>
</table>

Table 3. Outcome for 68 pregnancies reported in women living with PHIV

<table>
<thead>
<tr>
<th>Pregnancy type</th>
<th>Total No.</th>
<th>miscarriage</th>
<th>termination</th>
<th>continuing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live birth***</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Termination</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Continuing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Women were on ART at conception in 66% of pregnancies overall (43/65 where data available); 66% in first pregnancy, and 72% in second pregnancy.

Women were not on ART at conception in 7/11 pregnancies where CD4<200 cells/µL.

Median gestation at start of ART for women not on ART at conception was 17 weeks (IQR 10, 22) for pregnancies ending in live birth (n=17).

There were 5 pregnancies in which women received no ART: one miscarriage and four terminations. Women received combination ART in all pregnancies ending in live birth continuing.

See Figure 2 for class of ART prescribed in pregnancy (along with two NRTIs as a backbone).

Fig 2: Class of ART prescribed (live births and continuing = 56)

Fig 3: Mode of delivery (56 live births*)

Addional drugs

- Women received raltegravir in addition to their main ART combination in 13/56 pregnancies ending in live birth.
- Women received zidovudine during delivery in 29% (16/56) pregnancies ending in live birth.

Post-exposure prophylaxis

Where reported, all infants received PEP (13/57 data missing): 66% zidovudine monotherapy, 33% dual or triple therapy.

Infant HIV infection status

Of 57 live infants (one twin pregnancy), 44 were HIV negative, infection status had not been reported to the study for 12, and one infant was infected (in utero infection, mother had longstanding adherence problems).

Conclusions

Currently at least 6% of women with PHIV accessing care in the UK & Ireland have had one or more pregnancies, higher than the 3.4-4.1% estimated in HIV-positive women the UK CHIC cohort in 2000 to 2009.

Pregnant women with PHIV achieved similar rates of viral suppression to the population of HIV-positive pregnant women in the UK overall, but a higher proportion have a very low CD4 count in pregnancy. However, current numbers are low, so meaningful comparisons with horizontally-infected women are not yet possible.

This is a preliminary descriptive report of an emerging population; linking paediatric, pregnancy and second generation data will enable further monitoring of pregnancy outcomes in this unique group of women living with HIV.

References

The effect of tenofovir on renal function in HIV positive pregnant women
Flanagan S, Barnes L, Anderson J, Barber TJ

Background
• Tenofovir is a commonly used component of anti-retroviral therapy (ART) to reduce vertical transmission of HIV.
• There is limited data on the impact of tenofovir on renal function in pregnancy.
• We aimed to investigate the effect of tenofovir on renal function in pregnant women with HIV-1 in a UK clinic.

Methods
• We retrospectively analysed data on renal function in pregnancy from a cohort of women with HIV attending a busy inner city London antenatal clinic between January 2010 and September 2013.
• All women were screened for renal function throughout pregnancy via serum creatinine and estimated Glomerular Filtration Rate (eGFR) calculated using Modification of Diet in Renal Disease (MDRD) and corrected for ethnicity.

Results
• 97 HIV-1 positive women were registered at our antenatal service for a total of 105 pregnancies.
• Tenofovir was prescribed in 71/105 pregnancies (67.6%).
• 41/71 pregnancies were prescribed tenofovir pre-conception (57.7%). 21 (70%) of the remaining 30 pregnancies in which tenofovir was started during pregnancy, were initiated before 24 weeks gestation.
• There was no deterioration in median serum creatinine or decline in eGFR in women prescribed tenofovir during pregnancy.
• At 6 weeks after delivery, in the 42 women who continued tenofovir therapy and had eGFR measured, one woman had eGFR=60, all others eGFR >90.

Conclusions
• Our data shows tenofovir does not cause decline in renal function in pregnancy in women with HIV-1, whether started pre-conception or during pregnancy.
• Prospectively collected data looking at effects of tenofovir on other measures of tubular renal function in pregnancy such as proteinuria and protein:creatinine ratio would provide further evidence of the impact of tenofovir on renal function in pregnant women with HIV-1.

<table>
<thead>
<tr>
<th>Gestation (weeks)</th>
<th>No.(% of those prescribed tenofovir)</th>
<th>Median serum creatinine (Range)</th>
<th>eGFR&gt;90 (%)</th>
<th>eGFR&lt;90 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>45 (100 %)</td>
<td>55 (46-64)</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>44 (73.3 %)</td>
<td>53 (44-62)</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>47 (75.8 %)</td>
<td>53 (44-65)</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>54 (79.4 %)</td>
<td>54 (43-70)</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>54 (76.0 %)</td>
<td>55 (41-69)</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>36</td>
<td>58 (81.6 %)</td>
<td>56 (46-82)</td>
<td>99.98%</td>
<td>0.017%</td>
</tr>
<tr>
<td>6 weeks Postnatal</td>
<td>42 (63.6%)</td>
<td>60.5 (45-81)</td>
<td>99.97%</td>
<td>0.024 %</td>
</tr>
</tbody>
</table>

Table 1: Renal Function During Pregnancy
Introduction
Despite plasma levels of certain HIV drugs decreasing in the third trimester of pregnancy there is no definitive evidence that therapeutic drug monitoring (TDM) improves HIV control and prevents mother to child transmission (MTCT). Indeed ‘one off’ TDM measurements are thought to poorly correlate with overall drug exposure.

Aims
In our combined cohorts of HIV positive pregnant women, we aim to describe their HIV control, antiretroviral management during pregnancy and neonatal outcomes with respect to whether or not TDM was performed or not. Baseline demographic and clinical characteristics are also described.

Methods
Retrospective cross-sectional case note analysis was performed on HIV positive pregnant women with HIV who attended North Manchester General Hospital and Manchester Royal Infirmary from 1st January 2008 -28th May 2013. The baseline demographics, clinical data and drug history were extracted from the first appointment in HIV pregnancy clinic. Association was looked for with each variable and TDM. During and post pregnancy outcomes such as medication alterations, newly detectable viral load (NDVL), viral load detectable at birth (VLDB) and mother to child transmission (MTCT) were recorded to see if there was an association with TDM or any of the other baseline variables.

Baseline characteristics and associations with TDM

**171 PREGNANCIES WERE INCLUDED;**

- 39% (n = 65) HAD TDM.
- 51 FROM MRL, 120 FROM NMGH

**TDM WAS ASSOCIATED WITH:**

- Protease Inhibitor Use
- A History of Poor Adherence

**Table 1: TDMs association with HIV management during pregnancy and birth outcomes**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>TDM</th>
<th>No TDM</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDVL</td>
<td>171</td>
<td>171</td>
<td>140</td>
<td>0.829</td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>0.7</td>
</tr>
<tr>
<td>No</td>
<td>154</td>
<td>156</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>VLDB</td>
<td>171</td>
<td>171</td>
<td>140</td>
<td>0.351</td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>0.7</td>
</tr>
<tr>
<td>No</td>
<td>154</td>
<td>156</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>Med alteration</td>
<td>171</td>
<td>171</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>154</td>
<td>156</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td>164</td>
<td>164</td>
<td>140</td>
<td>0.625</td>
</tr>
<tr>
<td>Normal vaginal</td>
<td>81</td>
<td>81</td>
<td>66</td>
<td>0.49</td>
</tr>
<tr>
<td>Elective C-section</td>
<td>43</td>
<td>43</td>
<td>34</td>
<td>0.29</td>
</tr>
<tr>
<td>Emergency C-section</td>
<td>40</td>
<td>40</td>
<td>37</td>
<td>0.23</td>
</tr>
<tr>
<td>Protein</td>
<td>150</td>
<td>150</td>
<td>125</td>
<td>0.999</td>
</tr>
<tr>
<td>(g/L pre-week)</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>138</td>
<td>138</td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>Low birth weight</td>
<td>136</td>
<td>136</td>
<td>116</td>
<td>0.824</td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>16</td>
<td>13</td>
<td>0.52</td>
</tr>
<tr>
<td>No</td>
<td>100</td>
<td>100</td>
<td>93</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions
- TDM’s association with PI use is expected as serum levels are known to decrease in the third trimester
- TDM is often used to confirm adherence and its increased use in patients with a history of poor adherence is expected
- TDM was not associated with improved HIV control during pregnancy
- TDM’s association with medication alterations is thought to be causal. With the absence of any other evidence of TDM improving HIV control in pregnancy these changes may be unnecessary.
- TDM was not shown to have any additional benefit in pregnancy and its routine use is not recommended to improve HIV control or reduce MTCT.
Severe Birth Defects in Children Perinatal Exposed to HIV from a “Real World” Setting – Infectious Diseases National Institute, Bucharest, Romania

Authors: Ana Maria Tudor1,2, Mariana Mărdărescu1, Ioana Alina Anca1,3, Cristina Petre3, Cosmina Cristea1, Ruxandra Neagu Drăghicenoiu2, Rodica Ungurianu2
1. “Carol Davila” University for Medicine and Pharmacy, Bucharest; 2. „Matei Bals” Infectious Diseases National Institute, Bucharest; 3. „Alfred Rusescu” Mother and Child Protection Institute, Bucharest

Background: The shift in epidemic trends of HIV vertical transmission in last years in Romania:
- iv drug user’s mothers, co infected with hepatitis viruses and with social problems
- young mothers with an old HIV infection and long antiretroviral therapy history

Materials and Methods: - Studied population - all HIV perinatal exposed children routinely followed up in Pediatric Department from Infectious Diseases National Institute,
- Duration - Jan 1st 2006 - Dec 31st 2012.
- Birth defect = any anomaly - clinical and/or imaging found in babies at birth or in the first months of life
- Virologic data – used to diagnosed the HIV infection in children and mothers
- HIV exposed children – HIV positive serologic tests at birth and undetectable HIV RNA at 3,12 and 18 month of age
- HIV infected children – detectable HIV RNA at any age
- HIV infected mothers – positive serologic tests and detectable HIV RNA at any moment of pregnancy
- Analyses
  - describing the birth defects (BD)
  - association with certain risk factors: gender, mother’s age at birth and exposure to antiretroviral in first trimester of pregnancy

Results:
- 244 children born by HIV infected mothers.
- The incidence of HIV infection was 16.39% (40/244 cases).
- The rate of any birth defects was 39.34% (96/244 cases).
- Two children died during first year of life due to severe malformations.
- 9% of cases had associated malformations.
- 9 cases of severe congenital anomalies: complex heart defect, total congenital aganglionic megacolon, anal imperforation, Dandy Walker Syndrome, gangliosidosis, Niemann Pick syndrome, Down syndrome, true hermaphroditism and cleft palate.

Table 1 Demographic characteristics in off springs of HIV infected mothers

<table>
<thead>
<tr>
<th></th>
<th>Birth Defects</th>
<th>Non Birth defects</th>
<th>Statistic Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/Female</td>
<td>58/38</td>
<td>82/66</td>
<td>0.44</td>
</tr>
<tr>
<td>Number of HIV infected babies</td>
<td>14</td>
<td>26</td>
<td>0.53</td>
</tr>
<tr>
<td>CART before and in 1st trimester of pregnancy</td>
<td>47</td>
<td>73</td>
<td>0.88</td>
</tr>
<tr>
<td>Mothers’ median age at birth (years) / standard deviation</td>
<td>22 +/- 5.7</td>
<td>22 +/- 5.09</td>
<td>-</td>
</tr>
</tbody>
</table>

Case No 1
Ovotesticular disorder of sex development
Born 2011,
Karyotype - 46 XY, Male and female genitalia
Male phenotype
Parents – both born 1989, cART for 15 years

Case No 2
Dandy Walker Syndrome
Boy, born 2011
Mother: HIV+ at 14 years old, born 1990, 7 years of cART before pregnancy

Conclusion:
- rate of birth defects among HIV exposed children was not significant associated with antiretroviral exposure,
- we identify very rare and severe congenital conditions.
- we noticed a trend to increasing number of birth defects in 2012 among studied patients compare to previous years.

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This paper is supported by the Second Operational Programme Human Resources Development (SOP HRD), financed from European Social Fund and by Romanian Government under contract number POSDRU/159/1.5/s/137390
The challenges of managing antiretroviral treatment in children perinatally infected with HIV in Romania

Mărdărescu, Mariana; Cibea, Alina; Petre, Cristina; Neagu-Drăghicienoiu, Ruxandra; Ungurianu, Rodica; Petrea, Sorin; Tudor, Ana Maria; Vlad, Delia; Matei, Carina; Alexandru, Mărdărescu

1National Institute for Infectious Diseases “Prof. Dr. Matei Balș”, Paediatric Immunodepression Department, Bucharest, Romania;
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HIV Drug Therapy Glasgow, 2-6 November 2014

Background

During the recent years the rate of HIV perinatally exposed children in Romania has increased as a consequence of the expanding number of HIV infected women. These women belong

- to Romania’s long terms survivors, aged between 20-24 years
- to the group of new HIV infection cases (20-24 years), acquired through unsafe sexual contact and use of new psychoactive substances (PAV)

In this context, due to universal access to ART in 2001, the HIV mother-to-child transmission rate in Romania is below 5%.

Materials and methods

- surveillance of 396 HIV perinatally exposed children in National Institute for Infectious Diseases “Prof. Dr. Matei Balș”, Bucharest.
- born between 2008 and 2013
- of them, 43 acquired HIV through materno-fetal transmission. Our aim was to observe the characteristics in their evolution under antiretroviral treatment and to emphasize the causes of treatment failure.
- children with perinatally acquired HIV infection were followed in a retrospective case series
- we assessed maternal characteristics, HIV vertical transmission prophylaxis, timing of diagnosis, viroimmunologic status, features of the evolution under ART.

Results

- The rate of mother to child HIV transmission was 10.8% vs. the national rate registered in 2013 (<5%) 
- 16% of mothers belonged to the Romanian ‘90s cohort and 84% were recently infected with HIV, through unprotected sexual contact (70%) or use of new psychoactive substances (14%) 
- 51% of mothers were diagnosed perinatally as a consequence of their reluctance to access specific health services and in 57% CD4 value was < 350 cell/mm² 
- 35% of the monitored children were diagnosed with HIV infection at birth
- Their median entry CD4 value was 23% and 49% had a CD4 > 25%; median entry viral load was 7 log. 
- 16 patients (37%) had undetectable viral load after six months of treatment. In 87.5% of them the virologic suppression was achieved and maintained with one single regimen (2 NRTIs + 1 NNRTI or 2 NRTIs + 1 PI/r). 
- 15 children (35%) didn’t achieve suppression of viral load 
- 19 children (44%) faced special issues related to adherence to antiretroviral treatment, due to mothers’ poor adherence to a basic set of care provided for their children.

Conclusions

- Prevention programmes in Romania must be designed on the basis of the new economic context and emerging psychoactive substance use.
- Hence, women who use drugs should benefit from a wider access to medical and social services.

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Possible association between the stage of HIV disease, antiretroviral treatment and the nutrient composition of breast milk.

Van den Heever WJM1, De Wet G2, M Hattingh2

1Department of Health Sciences, Central University of Technology, Free State, Bloemfontein, SA | 2 Pathicare Reference Laboratory, Bloemfontein, SA

BACKGROUND

Breastfeeding is a major source of childhood nutrition and protection, but with South Africa having one of the highest HIV prevalence in the world the risk of HIV transmission from mother to infant through breastfeeding becomes a major issue. Infant mortality due to malnutrition and infections is also of great concern. The most alarming factor is the increase in child mortality from 1980 to 2005 in the country, with an increase from 56.3 per 1 000 in 1990 to 65.5 per 1 000 in 2005 (Smit, 2007; UNAIDS, 2006).

In South Africa where replacement feeding may not be affordable, feasible or sustainable, HIV infected women are recommended to exclusively breastfeed their infants during the first 6 months of life. The question arises whether HIV disease progression and its metabolic impact on the mother will affect the nutrient composition of breast milk. Limited information is available on the nutrient composition of HIV-infected mother’s breast milk and to reduce morbidity and mortality among HIV-infected children, guided decisions related to child nutri-
tion and the improvement of quality of life is necessary (Blim-Germann et al., 2008).

AIM

The aim was to determine the possible association between HIV dis-
ease progression, as measured by the immunological markers, and the nutrient composition of breast milk.

METHOD

The study followed that of a descriptive design. The nutrient composi-
tion of breast milk of 100 HIV-infected and 50 non-infected HIV volun-
teers (control group) belonging to visiting mothers at the Paediatics/Neonatal wards of National, Pelserno- and Universitas hos-
pitals, Bloemfontein, were measured. The HIV-infected group was sub-
divided into a HIV naive and HIV ARV treatment group. Blood (2 x 5 ml EDTA tubes) and breast milk samples (5-10 ml) were collected by a reg-
istered medical nurse.

Macronutrients namely lactose, proteins, fat, total solids and the energy content of the breast milk and micronutrients namely Calcium and phosphate were measured. The blood and immunological param-
ers comprised of CD4/CD8 + T cell counts, viral loads and full blood counts. Below is a summarized lay out of the data collection (Fig 1).

RESULTS

Figure 2 reflects the treatment regime of the selected study population. Fifty % represents the naive HIV-infected participants, 23% received Dual treatment and 27% was on HAART treatment.

Fig 1. Summarized lay out of the data collection.

Fig 2. Treatment regime of the selected study population

In all the study groups the mother’s breast feed exclusively. The frequency of breastfeeding in the different group was almost the same and no significant differences were detected between the infected and non-infected group. Although vitamin supplementation is recommend-
ed for pregnant women on 12% of the participants (7% below 20% infected HIV group and 5% in the 198 infected) and were taking vitamin supplement.

Table 1. Haematological and immunological parameters of the HIV-
infected and non-infected HIV group.

Table 2. Haematological and immunological parameters of the HIV-
infected population

Table 3. Composition of milk nutrients between the HIV-infected and non-infected group.

Table 4. Composition of milk nutrients in the HIV-infected study population.

Protein levels amongst the HIV-infected group showed a significant el-
eviation (p < 0.0001) compared to the control group. The calcium levels of the HIV-infected group were significantly lower (p=0.0001) than the control group (Table 3). No statistically significant differences were re-
corded of the measured nutrients between mothers receiving treatment and the HIV naive group (Table 4).

The Spearman Correlation Coefficient was used to determine if HIV dis-
ease progression have an influence on the nutrient composition. For the HIV-naive group, a significant correlation was found between the viral load and percentage total solids in breast milk. A correlation be-
tween the CD4 + T cell count, the percentage total solids and energy content of the breast milk was determined in the HIV-ARV treatment group. No strong positive correlation could be established between the immunological markers, HIV disease progression and the nutrient com-
position in the breast milk.

CONCLUSION

HIV mothers can breastfeed their babies even at a more advanced stage of HIV disease progression, but emphasis been placed on exclusive breastfeeding.

The results of this study clearly underline the need for further investi-
gation. The same study design can be used but a larger study popula-
tion should be incorporated.

Only a limited number of milk constituents could be analyzed due to the difficulty of analyzing the milk and the high cost of the milk analyses.

REFERENCES


N

Thinking Beyond

Thinking Beyond
With the implementation of cART and prevention of mother-to-child transmission (MTCT), we observed dramatic decreases in rates of perinatal mother-to-child transmission of HIV: 0.3% in France in women with plasma viral load (pVL) <50 c/ml at delivery. We describe a case of MTCT, the first case in our centre since 2002, which occurred despite virologic suppression of the mother at delivery.

**BACKGROUND**

A 26-year-old black woman, Guinea-native, living in France since 2007, was diagnosed with HIV-1 CRF02 in October 2008 at a gestational age [GA] of 15 weeks. She received zidovudine/lamivudine + saquinavir/ritonavir (r) and delivered in March 2009 a female baby, HIV negative.

**DESCRIPTION OF THE CASE**

**- First pregnancy -**

Second pregnancy occurred in 2012; mother was treated with abacavir/lamivudine + lopinavir/r switched to atazanavir/r 300/100 mg daily (qd) was introduced. Viral load (VL) decreased to 2.4 log₁₀ c/ml in 4 weeks and CD4 increased to 456/mm³. In December, at week 22 of GA, viral rebound at 4.14 log₁₀ c/ml due to sub-optimal maternal adherence was observed. After counselling, pVL decreased to 1.69 log₁₀ c/ml in March 2014, at week 35 of GA and 1.3 log₁₀ c/ml at delivery (2014-04-28). As pVL was <400 c/ml at week 36 of GA, vaginal delivery was decided but with IV zidovudine.

However, because of poor/uncertain maternal adherence to cART, the neonate was treated with a combination of 2 drugs (lamivudine-nevirapine) in addition to zidovudine, until the result of delivery pVL. This combination was stopped at day 2 when maternal delivery pVL (22 c/ml) was received and standard oral zidovudine prophylaxis was continued.

**- Second pregnancy -**

Second pregnancy began in July 2013 and baseline characteristics in September were as follow: week 13 of GA, CDC stage A, CD4 317/mm³, pVL 4.89 log₁₀ c/ml. cART with abacavir/lamivudine and atazanavir/r 300/100 mg daily (qd) was introduced. Viral load (VL) decreased to 2.4 log₁₀ c/ml in 4 weeks and CD4 increased to 456/mm³. In December, at week 22 of GA, viral rebound at 4.14 log₁₀ c/ml due to sub-optimal maternal adherence was observed. After counselling, pVL decreased to 1.69 log₁₀ c/ml in March 2014, at week 35 of GA and 1.3 log₁₀ c/ml at delivery (2014-04-28). As pVL was <400 c/ml at week 36 of GA, vaginal delivery was decided but with IV zidovudine.

**- Third pregnancy -**

Infant was tested for HIV infection at baseline (day 3) and found to be HIV-infected (HIV RNA 60 c/ml) demonstrating in-utero HIV transmission. Kinetics of VL was in favour of a MTCT in the first days of April (mother’s VL = 3 log₁₀ c/ml at W38 GA).

On day 15, zidovudine prophylaxis was discontinued and treatment for HIV infection initiated with standard cART according to the French Paediatric Antiretroviral Guidelines.

**CONCLUSION**

The risk of HIV acquisition is low in infants born to women who receive standard cART during pregnancy and labor when viral load is undetectable at delivery. However, transmission remains a hazard, with possibility of in-utero infection during episodes of sub-optimal adherence, associated with transient viremia. Potential low-risk of mother-to-child transmission has to be mentioned to all pregnant women, even if viral suppression is obtained during pregnancy, with regular counselling on the danger of even transient episodes of non adherence.

Special thanks to the parents for their support and confidence in the medical team and to Solene Pineau for layout and technical assistance.

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Transmitted drug resistance in women with intrapartum HIV-1 diagnosis: a pilot epidemiological survey in Buenos Aires, Argentina

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Background:
- Surveillance of primary resistance to antiretroviral drugs is particularly important in pregnant population, in which infection by drug resistant HIV has not only implications for maternal treatment, but could also jeopardize the efficacy of neonatal prophylaxis.
- A prior report showed an overall high prevalence (20%) of transmitted drug resistance in HIV-infected pregnant women in our setting (Zapiola I et al, IAS 2011).
- We aim to describe the prevalence of resistance associated mutations (RAMs) in pregnant women with intrapartum HIV diagnosis, the group with highest mother-to-child transmission risk, in a public hospital of Buenos Aires, Argentina.

Materials and Methods:
- Prospective pilot study (period 2008-10/2013). Baseline Plasma samples were tested for viral load by Versant HIV-1 RNA 3.0 (bDNA) and sequenced using HIV-1 TRUGENE Genotyping Kit (Siemens).
- Women had intrapartum diagnosis by Alere Determine™ HIV-1/2 rapid assay. All cases were confirmed by ELISA and Western blot.
- The prevalence of RAMs was analyzed according to World Health Organization (WHO) criteria.
- Epidemiological data regarding mother-child binomium were collected in all cases.

Results:
- Of 231 HIV-infected pregnant women assisted, 6% (n = 14) had intrapartum diagnosis of HIV infection.
- 12 (85.7%) had previous pregnancies, 10 (71.4%) had inadequate prenatal care and 3 (23.1%) seroconverted during pregnancy.
- Maternal characteristics (expressed medians and ranges) were: age 25.5 (16-35) years; gestational age at birth: 39 (30-42) weeks; CD4 count: 500 (132-925) cells/μL; viral load: 9418 (1800-55299) copies/mL. No one had HBV or HCV coinfection; 4 (33.3%) had syphilis.
- 8 (57.1%) had vaginal delivery and 6 emergency C-section (42.9%). In 6 cases (46.2%), membrane rupture was spontaneous.
- 4 patients (28.6%) failed to receive intrapartum zidovudine (ZDV) infusion.
- In 12 patients a genotypic resistance test was performed: 2 (16.7%) had WHO RAMs corresponding to K103N mutation in both cases, 4 patients (28.6%) failed to receive intrapartum zidovudine (ZDV) infusion.
- 2 newborns (14.3%) were preterm. All received neonatal prophylaxis: ZDV in one case and combined prophylaxis (ZDV/3TC/NVP) in the remaining 13 (92.9%). All newborns were formula-fed.
- Two (14.3%) had congenital syphilis, one of whom died.
- One newborn was HIV-infected (positive proviral DNA at 24 hours of life, wild-type HIV). It was assumed as infection.
- A summary of mother-child binomium profile is shown in table 1.

Table 1. Epidemiologic, obstetric and resistance profile of mother-child binomium with intrapartum HIV-1 diagnosis.

<table>
<thead>
<tr>
<th>Case #</th>
<th>Gestational age at delivery (weeks)</th>
<th>Viral load (copies/mL) ZDV intrapartum infusion</th>
<th>RAMs</th>
<th>Mode of delivery</th>
<th>Neonatal prophylaxis</th>
<th>Neonatal HIV status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>38</td>
<td>3137</td>
<td>None</td>
<td>ECS</td>
<td>ZDV</td>
<td>Negative (18 month ELISA -)</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>36964</td>
<td>None</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>N/A</td>
<td>None</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (18 month ELISA -)</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>N/A</td>
<td>Genotype not done</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (18 month ELISA -)</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>1800</td>
<td>None</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (18 month ELISA -)</td>
</tr>
<tr>
<td>6</td>
<td>42</td>
<td>8980</td>
<td>None</td>
<td>ECS</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>7</td>
<td>40</td>
<td>6388</td>
<td>None</td>
<td>ECS</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (18 month ELISA -)</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>28245</td>
<td>None</td>
<td>ECS</td>
<td>ZDV-3TC-NVP</td>
<td>Lost to follow-up</td>
</tr>
<tr>
<td>9</td>
<td>39</td>
<td>5607</td>
<td>None</td>
<td>ECS</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
<td>2205</td>
<td>None</td>
<td>ECS</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>11</td>
<td>40</td>
<td>29657</td>
<td>K103N (+ E138K)</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Positive (24-hour PCR (+) in utero infection)</td>
</tr>
<tr>
<td>12</td>
<td>38</td>
<td>N/A</td>
<td>None</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>13</td>
<td>38</td>
<td>N/A</td>
<td>Genotype not done</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
<tr>
<td>14</td>
<td>39</td>
<td>55299</td>
<td>None</td>
<td>Vaginal</td>
<td>ZDV-3TC-NVP</td>
<td>Negative (1 and 6 month PCRs [-])</td>
</tr>
</tbody>
</table>

ECS: emergency cesarean section; N/A: not available; RAMs: resistance associated mutations; sdNVP: single dose nevirapine; ZDV: zidovudine.

Conclusions and Discussion:
- This pilot study suggests that levels of transmitted resistance in this high risk population of pregnant women, could be moderate to high.
- The prevalence of transmitted drug resistance observed in this subpopulation is comparable with our prior report in HIV-infected pregnant women.
- We preliminary observed high level resistance to NVP: if this finding is confirmed with a larger sample, it could potentially jeopardize the utility of this drug in the combined neonatal prophylaxis recommended in the absence of maternal antiretroviral therapy.
- Further research is needed to determine the best prophylaxis of newborns with in utero and intrapartum exposure to drug-resistant HIV.
Prevention of Mother-to Child Transmission – Experience of a Portuguese Center

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Background

- HIV infection during pregnancy still raises controversial issues
- Combined anti-retroviral therapy (cART) has been successful in reducing mother-to-child transmission (MTCT)
- Routine screening in pregnancy and in pre-conception consultation proved to be one of the best methods to be able to get this treatment on time
- We review our experience with pregnant patients with HIV infection

Materials and Methods

- Retrospective and descriptive study
- Data obtained from HIV-infected pregnant women from 1999 to 2012, with delivery and subsequent Infectious Diseases follow-up at our hospital

Results

- 136 patients
- 169 pregnancies
  - 147 living newborns (2 twin pregnancies)
  - 1 stillbirth
  - 23 abortion

  Median age at pregnancy - 30 (sd 5.7) years

Co-infection

- 103 (76%) HIV-1
- 26 (19%) HIV-2
- 1 (1%) HIV 1+2

Risk factor

- 102 (75%) sexual
- 31 (23%) IDU
- 1 (2%) transf
- 1 (1%) MTCT

HIV types

- 131 HIV-1
- 2 HIV-2
- 1 HIV 1+2

ARVT on pregnancy

<table>
<thead>
<tr>
<th>ARVT on pregnancy</th>
<th>n (%)</th>
<th>ARVT on pregnancy</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NRTI (zidovudine)</td>
<td>14 (8%)</td>
<td>2 NRTIs + 1 PI/r</td>
<td>76 (45%)</td>
</tr>
<tr>
<td>2 NRTIs</td>
<td>1</td>
<td>2 NRTIs + 1 PI</td>
<td>57 (34%)</td>
</tr>
<tr>
<td>2 NRTIs + 1 NNRTI</td>
<td>1</td>
<td>3 NRTIs + 1 PI/r</td>
<td>7 (4%)</td>
</tr>
<tr>
<td>No ART</td>
<td>12 (7%)</td>
<td>1 NRTI + 2 PI/r</td>
<td>1</td>
</tr>
</tbody>
</table>

Time of diagnosis

- 97 (previously screened)
- 33 (routine screening)
- 4 (delivery)
- 2 (after delivery)

Viral load at delivery

- 86 (51%) undetectable
- 20 (12%) 101-1000 c/mL
- 15 (9%) >1000 c/mL

- At the time of delivery
  - 91.7% of patients on ART had undetectable viral load
  - 119 (70.4%) women had a TCD4 cell count above 200 cells/mm³

MTCT occurred in 3/147 cases (2%):

- In one mother HIV-1 infection was diagnosed 3 weeks before delivery (1999)
- 1 immediately after delivery (2000)
- 1 started cART (2NRTI+1PI/r) in the second trimester of pregnancy, always adherent and without secondary effects, VL at delivery was 50 copies/mL and elective C-section was performed (2009)

Conclusions

- The fact that 24% of patients were diagnosed during pregnancy shows the importance of routine screening to all pregnant women
- MTCT occurred in 3 children, but only in one was administered cART for prevention

HIV Drug Therapy Glasgow, 2-6 November 2014