797

HIV resistance in pregnant women with detectable HIV-1 RNA at delivery in Mozambique

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Introduction

- Maternal HIV infection is responsible for the majority of new HIV pediatric infections and a significant cause of maternal and child mortality (1, 2).
- HIV mother-to child transmission (MTCT) remains an important public health challenge in most sub-Saharan countries (1).
- Administration of antiretrovirals (ARV) in pregnancy is the most effective intervention for preventing mother to child transmission of HIV (PMTCT) and for reducing HIV/AIDS maternal related deaths (3).

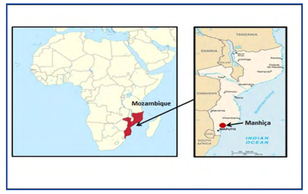


- In low-income countries with high HIV prevalence and in which antiretrovirals (ARV) have been scaled up following a public health approach, increasing presence of HIV drug resistance mutations (HIVDRM) to 1st line recommended ARVs for PMTCT have been found (4).
- Few data on HIV resistance in pregnant women are available from Mozambique, one of the countries with the highest HIV toll in the world.

Objective

To understand the HIV resistance implications of reaching delivery with detectable HIV-1 RNA, despite pMTCT, in pregnant women

Methods



We analyzed stored plasma samples from HIV-infected pregnant woman participating in a randomized controlled trial on intermittent preventive treatment of malaria in pregnancy (IPTp) at the Manhiça district hospital (MDH) in a semi-rural area in southern Mozambique.

Women with HIV-1 RNA levels>400 c/mL at delivery were included. HIVDRM were determined using MiSeq® (limit of detection 1%) at the 1st ANC visit and at the time of delivery.

Results

Fig 1 Study sample flowchart

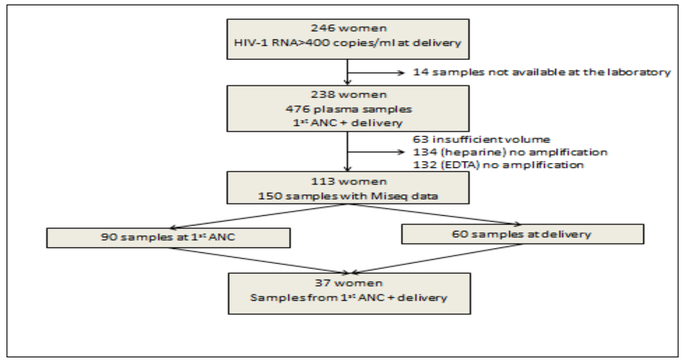


Table 1 Resistances by drug category at 1st ANC visit and at delivery

Resistance category	1st ANC visit (N=90)			Delivery (N=60)		
	n	%	Total	n	%	Total
At least one DRM[1]	15	16,7	90	8	13,3	60
At least one NNRTI DRM[2]	6	6,7	90	5	8,3	60
At least one NRTI DRM[3]	8	8,9	90	6	10,0	60
At least one PI DRM[5]	2	2,2	90	0	0,0	60

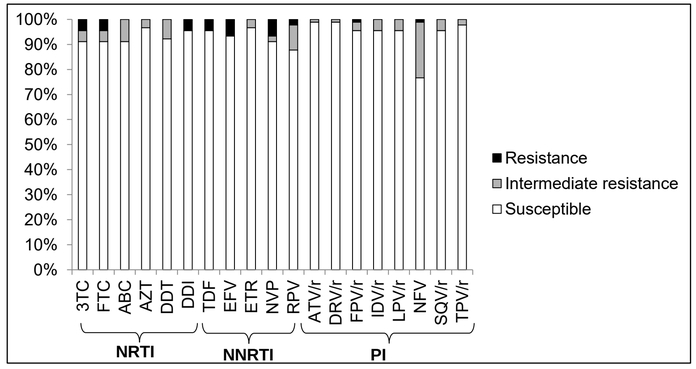
Of the 37 women with longitudinal data from the 2 time points, 8 (21.6%) developed at least 1 new HIVDRM during pMTCT; 2 (5.4%) to NNRTI, 2 (5.4%) to NRTI and 1 (3%) to PI.

Table 2 Characteristics at first ANC visit

Characteristics	Resistant (N=15)		Not resistant (N=75)	
	n	%	n	%
Age, median (IQR)	25 [18-29]		25 [22-30]	
Adolescences [1]	4	26.67	11	14.67
Gestational age, median (IQR)[2]	19 [12-22]		21 [19-24]	
3rd Trimester	2	13.33	17	22.67
Primigravida	5	33.33	16	21.33
N. of previous pregnancies, median (IQR)	3 [2-4]		3 [2-4]	
Illiteracy[3]	5	33.33	24	32.00
RPR +[4]	2	13.13	4	5.44
Anemia (Hb<11g/dl)	12	80.00	55	73.33
Malnutrition (MUAC<23)	2	13.30	2	2.67
HIV-1 RNA (copies/mL) median (IQR)	59372 [26200-176844]		42300 [12105-116933]	
Detectable HIV-1 RNA copies/ml5	15	100.00	74	98.67
CD4+ T-cell counts (cell/mm3), median (IQR)	416 [195-545]		401 [273-598]	
CD4+ T-cell counts <350 cell/mm3	10	66.67	45	60.00
Previous antiretroviral therapy[5]	2	14.29	14	19.18

[1] Age<19 years [2] Gestational age measured calculated from fundal height [3] No being able to read and/or write [4] Rapid plasma reagin test [5] HIV-1 RNA>400 copies/ml [5] Data available only in 86 subjects

Fig 2 Predicted susceptibility to NRT, NNRTI and PI among pregnant women at first antenatal care visit



- Even with ultrasensitive HIV-1 genotyping, less than 17% of women with detectable viremia at delivery had HIVDRM before initiating pMTCT with 1st line ARVs.
- One quarter of women developed resistance to at least one first line ARVs during pregnancy while on pMTCT
- Other factors beyond pre-existing resistance, such as lack of adherence or interruptions of the ANC chain, are relevant to explain lack of virological suppression in women receiving pMTCT at the time of delivery.
- Monitoring HIV resistance to ARV in pregnant women is essential for guiding prevention strategies to reduce MTCT and improve maternal health



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