

Late or missed HIV diagnosis during pregnancy is still occurring in a high-income country and represents a high risk of MTCT

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BACKGROUND AND OBJECTIVE

Globally, an estimated 1.3 million women and girls living with HIV become pregnant each year. Among pregnant women with HIV (pWWH), integrated strategies of early diagnosis and treatment during pregnancy and delivery have resulted in MTCT reduction to <2%. ART should be started as soon as possible regardless of CD4 T cells count to achieve plasma HIV RNA undetectable before delivery.

We aim to investigate pregnancy outcomes and analyse therapy changes in planning and during pregnancy in a real-life setting in Italy.

MATERIALS AND METHODS

Study design

- Retrospective study including all the available pregnancies of women enrolled in the ICONA Foundation Cohort Study from 2011 to 2024.

Diagnosis of pregnancy

- The date of conception (beginning of pregnancy) was calculated based on the gestational age at delivery or, if not available, as 38 weeks before the date of delivery.

Study procedures

- Demographic, clinical, immunovirological, and ART data are collected from the ICONA database.
- Other additional data on pregnancies were specifically required to the centers, including pregnancies outcomes (voluntary interruption of pregnancy, miscarriage, preterm delivery, intrauterine fetal death and full-term live birth), type (vaginal, scheduled or urgent cesarean section) of delivery and HIV status of the newborn.
- The date of HIV infection was defined as the date of the first positive HIV test. The HIV diagnosis occurred during pregnancy if the date of the first HIV test was after the date of the last menstruation.

Statistical analysis

- Chi-squared and Wilcoxon rank-sum test were used to describe population characteristics.
- Changes in ART, maternal immunovirological status and MTCT were analysed.

RESULTS-1

- 419 pregnancies in 311 pWWH were evaluated. Outcomes were available in 343 pregnancies (111 naives, 232 ART-experienced) of 264 pWWH: 35 miscarriages, 30 voluntary pregnancy interruptions and 278 full-term births (3 stillborns and 1 intrauterine death).
- 84 women were diagnosed with HIV while pregnant (42 1st, 35 2nd, 7 3rd trimester) and started ART at median gestational (IQR) time of 15 weeks (13-20).
- 10 women received diagnosis and ART in post-partum.

Foreign-born pWWH had the same chance of Italian-bornes of being diagnosed late or after pregnancy (11/165 vs 6/99 p=0.86).

Table 1: Demographic and clinical characteristics of pWWH at their first pregnancy

Variables	Total N=264 (100%)	ART-naive N=109 (41%)	ART-experienced N=155 (59%)	p-value
Age (years), median [IQR]	29.0 [25.0-33.5]	30.0 [25-36.0]	28.0 [25.0-33.0]	0.033
Ethnicity, n (%)				<0.001
Asian	5 (1.9)	1 (0.9)	4 (2.6)	
Black	93 (35.2)	52 (47.7)	41 (26.5)	
Caucasian	140 (53.0)	41 (37.6)	99 (63.9)	
Hispanic-Latino	23 (8.7)	13 (11.9)	10 (6.5)	
Other/Unknown	3 (1.1)	2 (1.8)	1 (0.6)	
Education level, n (%)				0.006
Lower instruction	68 (25.8)	25 (22.9)	43 (27.7)	
Higher instruction	78 (29.6)	23 (21.1)	55 (35.5)	
Unknown	118 (44.7)	61 (56.0)	58 (36.8)	
Occupation, n (%)				0.006
Worker or student or housewife or retired	193 (73.1)	70 (64.2)	123 (79.4)	
Not occupied or invalid	71 (26.9)	39 (35.8)	32 (20.7)	
Mode of HIV transmission, n (%)				0.300
Heterosexual contact	238 (90.2)	101 (92.6)	137 (88.4)	
IDU	12 (4.6)	5 (4.6)	7 (4.5)	
Other/Unknown	14 (5.3)	3 (2.8)	11 (7.1)	
Months of HIV infection, median [IQR]	0.5 [0.1-3.4]	0.4 [0.1-1.0]	0.9 [0.2-7.9]	0.001
AIDS diagnosis, n(%)	21 (8.0)	2 (1.8)	19 (12.3)	0.002
Positive HCVAb, n(%) (N=263)	20 (7.6)	4 (3.7)	16 (10.3)	0.046
Positive HBsAg, n(%) (N=263)	9 (3.4)	3 (2.8)	6 (3.9)	0.741
Zenith HIV RNA (log ₁₀ copies/mL), median [IQR]	4.5 [3.9-5.1]	4.3 [3.5-4.8]	4.7 [4.1-5.2]	<0.001
Nadir CD4+, median [IQR]	313.0 [173.0-459.5]	376.0 [261.0-525.0]	276.0 [135.0-399.0]	<0.001
CD4 T (cell/mm ³) at enrolment, median [IQR]	372.5 [225.5-553.5]	411 [293.0-575.0]	349.0 [177.0-519.0]	0.022
CD8 T (cell/mm ³) at enrolment, median [IQR]	814.5 [576.0-1075.0]	775.0 [551.0-1010.0]	832.0 [579.0-1148.0]	0.205
HIV RNA (copies/mL) at enrolment median [IQR]	4.3 [3.6-4.9]	4.2 [3.4-4.7]	4.3 [3.8-5.0]	0.040

RESULTS-2

- Among the ART-experienced, 82/234 (35.0%) switched ART 6 months before pregnancy or in the first trimester: dolutegravir was interrupted in 6/114 (5%), cobicistat in 15/129 (12%) and tenofovir alafenamide in 21/226 (9%).
- Tenofovir disoproxil/emtricitabine remained the most common backbone in pregnancy (150/343, 44%). At delivery, a substantial proportion of pWWH received protease inhibitors (33%) and Integrase Strand Transfer Inhibitor (23%).

The proportion of women achieving viral suppression by the third trimester was 79% in 2011-2015 and 90% in 2016-2024; p=0.02. The median [interquartile range, IQR] CD4 value in the third trimester was 590.5 [385-787] in 2011-2015 and 660 [413-854] in 2016-2024; p=0.19.

Figure 1: Main ART regimens by calendar years in the first and third trimester of pregnancy

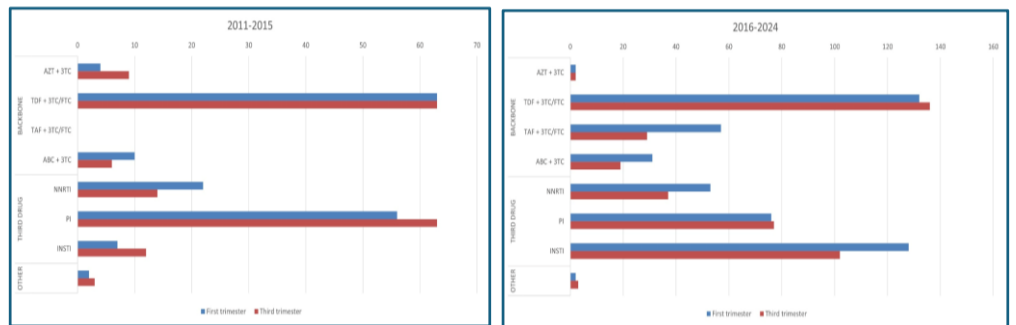


Figure 2: Backbone and third drug in ART naive pWWH

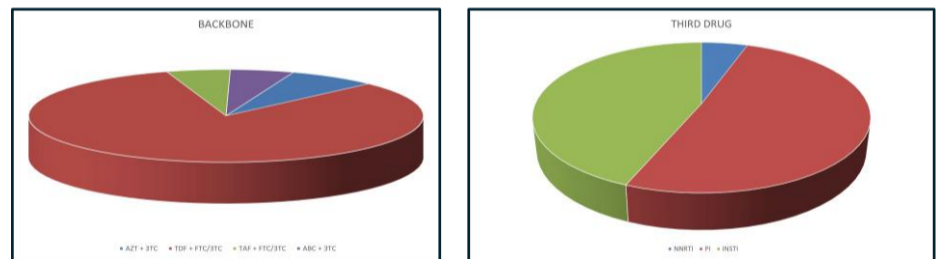
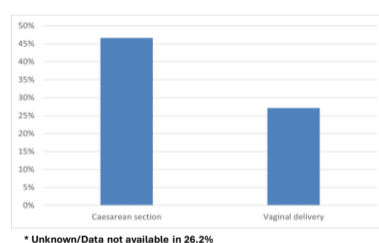


Figure 3: Mode of delivery



We observed three HIV-positive newborns (1.1%): the first from a mother diagnosed after positive test on newborn; the second from a mother diagnosed late during pregnancy and starting ART shortly before delivery (29 weeks) without obtaining HIV-RNA undetectability; the third in a woman lost to follow-up during pregnancy and returned to care after delivery. Two out of three pWWH were born outside Italy.

Table 2: Main characteristics of pregnancies where MTCT occurred

	Date of first HIV diagnosis	Age at pregnancy	Nationality	LM	Date of delivery	Starting ARV (date of ART)	CD4 at third trimester	HIV RNA at third trimester	Mode of delivery	Gestational age of delivery
Mother1	12/10/2015	35	Italy	01/06/2014	15/03/2015	NA 20/10/2015	NA	NA	Spontaneous vaginal	32+4
Mother2	19/07/2021	37	Nigeria	26/04/2021	31/01/2022	NA 20/06/2022	367	134089	NA	40+2
Mother3	14/11/2022	23	Ivory Coast	25/04/2022	12/01/2023	Yes 14/11/2022	452	290	Elective cesarean section	37+5

CONCLUSIONS

HIV diagnosis occurred late during pregnancy or was missed even after delivery in 17/264 (6.4%) of pWWH, resulting in three cases of MTCT.

Interventions are still needed to improve access to antenatal care and HIV testing, especially for foreign-born women. A greater effort should be made to ensure retention in care for all pWWH

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