Access to early infant diagnosis and antiretroviral therapy in Abidjan, Côte d'Ivoire, 2011-2013

D. Avit 1, M. Folquet-Amorissani 2; C. Amani-Bossé 1; J. Eliam-Kouakou 1; V. Méa-Assandé 1,3; E. A Aka 4 ; I. Ahoba 5; D. Ekouévi 1, 6,7; M. Timité-Konan 8; **V. Leroy** 6,7, for the MONOD ANRS 12206 Study Group.

1. Programme PACCI, Site ANRS, Projet Monod, Abidjan, Côte d'Ivoire. 2 Service de pédiatrie, Centre Hospitalier Universitaire (CHU) Cocody, Abidjan, Côte d'Ivoire. 3. FSU Abobo-Avocatier, Abidjan, Côte d'Ivoire. 4. Service pédiatrie, Centre de Prise en Charge, de Recherche et de Formation (CePReF), Site Aconda-vs, Yopougon, Abidjan, Côte d'Ivoire. 5, National Program of HIV Care, Abidjan. 6. INSERM, Centre INSERM U897 "Epidémiologie et Biostatistique", Bordeaux, France. 7. Université Bordeaux Segalen, Institut de Santé Publique Epidémiologie Développement (ISPED), Bordeaux, France. 8. Service pédiatrie, Centre Hospitalier Universitaire (CHU) Yopougon, Abidjan.

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BACKGROUND

- In 2010, HIV prevalence in Côte d'Ivoire (National AIDS program)
  - 3.4% in general population
  - 4.5% in pregnant women
  - 70 000 HIV-infected children
- In 2010, low coverage rates of:
  - PMTCT interventions: 47%
  - Early infant diagnosis: 4-10%
  - Antiretroviral Treatment of eligible children: <10%
    - <2% before 12 months of age
    - Median age at ART initiation: 5 years (IQR : 2-9) in 2008 (Anaky, Bull WHO, 2010)
- Since 2010, the routine initiation of early antiretroviral therapy (ART) is recommended by WHO for all HIV-infected children younger than two years old.
- Implementation of the 2010 WHO guidelines, after the post-electoral crisis in Côte d'Ivoire as follows:
  - The national Ivoirian program decided to scale-up the early infant diagnosis (EID) of HIV using Dried Blood Spot (DBS) in 2011.
  - EID in all HIV-exposed children, according to age:
    - >6 weeks-12 months: DNA PCR on DBS
    - 12-18 months: Antibody test to exclude infection first ± DNA-PCR
    - ≥ 18 months: Antibody test
    - One test (according to age) 6W after the end of breastfeeding exposure
  - Treat all HIV infected children less than 2 years of age.

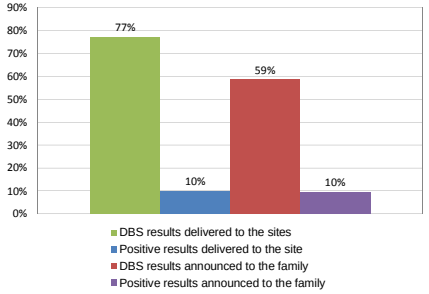
Objective: We described the access to pediatric HIV diagnosis results and pediatric ART before the age of two during the recruitment process in a pediatric research study in 2011-2013 in Abidjan, Côte d'Ivoire.

METHODS

In the context of the recruitment in the MONOD ANRS 12206 trial, we conducted a survey of the tools and timing used for EID, and the access to ART for all the children identified as HIV-infected before the age of two, from September 2011 to January 2013 in 29 health centers in Abidjan.
Families were interviewed during a medical follow-up or a phone call.
The rate of announcement of EID results, and the subsequent access to ART before the age of two were studied; barriers described and the correlates of early access to ART analyzed using a logistic regression model.

RESULTS

1. Figure 1: Post-test return rate of DBS testing performed in 29 centers (N=2397), Abidjan, Côte d'Ivoire, 2011-13



- No existing linkage between PMTCT services and pediatric care.
- Low DBS results delivery rate to families
- Lab delivery services delay of 15 days in median but coud reach 4 months.

2. Table 1: Access to pediatric HIV diagnosis before the age of 2 years in 29 pediatric centers, Abidjan, 2011-2013

Age (months)	Diagnosis method	Total (%)
0-12	PCR ADN on DBS (EID strategy)	184 (80.3)
12-18	PCR ARN on plasma	11 (4.8)
18-24	Serology	34 (14.9)
Total identified		229 (100.0)

3. Access to ART initiation before the age of 24 months, in 29 pediatric centers, Abidjan, Côte d'Ivoire, 2011-2013

Among the 229 children initially HIV-diagnosed
- 3 not confirmed: false positive tests (n=2), label error (n=1)
- 226 HIV-infected cases confirmed:
  - 172 early ART proposed: 76%
    - 148 initiated on ART: 65%, 95% CI [59% - 72%]
      70% (n=104) via the inclusion in the MONOD trial
    - 24 parent's refusal (stigma, or refusal after PMTCT failure): 11%
  - 9 lost to follow-up: 4%
  - 45 unmet needs of ART initiation due to child's death: 20%

4. Table 2: Access to early antiretroviral treatment (ART) before the age of 2 years according to their baseline characteristics (N=193). September 2011-July 2013, Abidjan, Côte d'Ivoire.

Variables	Total N = 193 (%)	ART initiated N= 148 (%)	ART not initiated N= 45 (%)	P-value
Age (months)				0.000
Median ; inter-quartile interval	8 [2-23]	9 [2-23]	5 [2-21]	
0-6	80 (41.5)	53 (66.3)	27 (33.8)	
7-12	51 (26.4)	37 (72.6)	14 (27.5)	
> 12	62 (32.1)	58 (93.6)	4 (6.5)	
Sex				0.755
Boy	99 (51.3)	75 (75.8)	24 (24.2)	
Girl	94 (48.7)	73 (77.7)	21 (22.3)	
Place of residence				0.002
Abobo	49 (25.4)	46 (93.9)	3 (6.1)	
Yopougon	90 (46.6)	67 (74.4)	23 (25.6)	
Other	54 (28.0)	35 (64.8)	19 (35.2)	
Health care level				0.009
Tertiary	38 (19.7)	22 (57.9)	16 (42.1)	
Secondary	19 (9.8)	16 (84.2)	3 (15.8)	
Primary	136 (70.5)	110 (80.9)	26 (19.1)	
Transportation duration between home and health care center				0.000
Less than 1 hour	123 (63.7)	83 (67.5)	40 (32.5)	
More than 1 hour	70 (36.3)	65 (92.9)	5 (7.1)	

5. Factors associated with early ART initiation before the age of 2 years: univariate regression analysis

Variables	Total (N=193)	Odds Ratio	(95% CI)	P-value
Child's age at time of diagnosis (months)				< 0.001
0-6	80	1	-	
7-12	51	1.3	(0.6 2.9)	0.45
> 12	62	7.4	(2.4 22.5)	< 0.001
Child's sex				0.75
Boy	99	1	-	
Girl	94	1.1	(0.6 2.2)	
Transport delay between home and health care center				< 0.001
Less than one hour	123	1	-	
More than one hour	70	6.3	(2.3 16.8)	
Maternal age at time of child's diagnosis (years)				0.020
15-29	91	1	-	
30-44	102	2.2	(1.1 4.4)	0.02
Child's caregiver on ART				0.003
No	107	1	-	
Yes	86	3.2	(1.5 6.7)	
Father's education level				0.10
Primary school and less	108	1	-	
Seconday or high school	85	1.8	(0.9 3.6)	
Father remunerated activity				0.01
No	77	1	-	
Yes	116	0.4	(0.2 0.8)	
Self-reported father's HIV status				0.000
Negative	52	1	-	
Positive	42	2.4	(0.6 9.5)	0.22
Unknown	99	0.3	(0.1 0.8)	0.02
Father informed of his child's HIV status				0.000
No	71	1	- -	
Yes	122	6.9	(3.3 14.4)	

6. Factors associated with early ART initiation before the age of 2 years: adjusted regression analysis

Variables	Total (N = 193)	Full model aOR	Full model (95% CI)	Full model P-value	Final adjusted model aOR	Final adjusted model (95% CI)	Final adjusted model P-value
Child's age at time of diagnosis (months)				0.005			0.002
0-6	80	1			1		
7-12	51	1.1	(0.4 2.8)	0.907	1.2	(0.5 2.9)	0.756
> 12	62	6.2	(1.8 20.9)	0.003	6.9	(2.1 23.0)	0.002
Child's sex				0.586			0.728
Girl	94	1.2	(0.5 2.9)		1.1	(0.5 2.5)	
Child's caregiver on ART				0.071			
Yes vs. No	86	2.3	(0.9 5.6)				
Father informed of his child's HIV status				0.008			0.000
Yes vs. No	122	4.7	(1.5 14.7)		6.1	(2.7 13.7)	
Father remunerated activity				0.236			
Yes vs. No	116	0.5	(0.2 1.5)				
Self-reported father's HIV status				0.777			
Negative	52	1					
Positive	42	2.4	(0.5 10.7)	0.262			
Unknown	99	1.2	(0.3 4.3)	0.759			
Transport delay between home and care center				0.018			0.003
≥ 1 hour vs. less	70	4.3	(1.3 14.4)		5.3	(1.8 15.9)	

aOR: adjusted Odds Ratio; 95% CI: Confidence Interval

In the final adjusted regression analysis, a child's age ≥12 months, the fact that the father was informed of his child HIV status and transport's delay ≥ 1 hour between home and the health care center were significantly associated with an initiation of pediatric ART before the age of

CONCLUSION

- Despite an acceptable ART coverage before the age of 2 in this study, too many missed opportunities for the access to ART before 2 years remain in 2011-2013 in Abidjan.
- Challenges still remain to improve identification of HIV-infected infants at the earliest convenience, and to promote a continuum of care for HIV-infected children before they die, by:
  - Organizing and strengthening linkages between PMTCT and pediatric HIV services
  - Mobilizing the community and health care staff to reduce stigma regarding EID and pediatric ART
  - Approaching and involving fathers to prepare HIV post-test counseling and access to ART
- With the commitment of the National Program, it is crucial to identify sustainable mechanisms to promote an early access to infant HIV care services within a family approach in Côte d'Ivoire.

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- Co-investigators: Coordination: Dr V. Leroy (Inserm U897); Clinical investigators: Pr M. Timité_Konan (CHU Yopougon, Abidjan), Pr N. Meda (Ouagadougou university), Pediatrics : Pr S. Blanche (Necker Hospital), Pr P. Lepage (Bruxelles University); Pharmacology : Pr JM Treluyer; D. Hirt (Descartes University), Virology : Dr C. Devaux, Pr C. Rouzioux, Pr P. Van de Perre
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