Outcomes of perinatally HIV-infected adolescents on antiretroviral therapy in Southern Africa

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Background

- With improved pediatric antiretroviral therapy (ART) access, perinatally HIV-infected children are now surviving into late childhood and adolescence in resource-limited settings.
- There are limited data on characteristics and outcomes of these children.

Methods

- Data came from the International epidemiologic Databases to Evaluate AIDS Southern Africa (IeDEA-SA) Collaboration, a regional collaboration of adult and pediatric HIV care and treatment programs. (www.iedea-sa.org)
- We included all children with presumed perinatal HIV infection (defined as ART initiation at <9.5 years old without documented non-perinatal acquisition of HIV) and remaining in care beyond 10 years of age at 10 IeDEA-SA sites in 3 countries (Malawi, South Africa, Zimbabwe) from 2000-2012.
- We described characteristics at ART initiation, at entry into the analysis at age 10 years and at the end of follow-up. The probabilities of death, loss to follow-up (LTFU) (no visit for 270 days before database closure) and transfer out to another program between 10 and 13 years of age were determined using the Kaplan-Meier estimator and the cumulative incidence function using competing risks analysis.

Results

- Characteristics of 2,161 children included are shown in Tables 1 and 2. Most children initiated a regimen of stavudine+lamivudine with either efavirenz (77%) or nevirapine (10%); 13% initiated other regimens.
- Median (IQR) duration on ART at entry into the analysis (age 10 years) was 33 (18 - 50) months.
- By 13 years of age the probabilities (95% CI) of death, loss to follow-up and transfer out were 0.8% (0.5-1.5); 7.3% (5.9-9.1); and 30.4% (28.0-32.9). Results from competing risks analysis are shown in Figure 1. Transfer out was mostly from tertiary to primary care sites.
- Among 1,913 children from sites with routine virologic monitoring, 405 (21%) had experienced at least one episode of virologic failure (confirmed HIV-RNA >1000 copies/ml) by the age of 13 years.

Table 1: Characteristics of children with presumed perinatal HIV infection who survive to at least 10 years of age. Characteristics are desribed at ART initiation and at age 10 years.

	At ART initiation n=2,161	At 10 years of age n=2,161
Female (n/N; %)	1,063/2,161 (49.2%)	As at ART initiation
Median (IQR) age in years	7.3 (5.8 to 8.5)	All age 10 years old
WHO Stage III/IV disease (n/N; %)	1,380/1,649 (83.7%)	Not measured
Median (IQR) CD4 count (cells/µl)	292 (137 to 490)	744 (526 to 1,004)
CD4 <200 cells/µl (n/N; %)	555/1,594 (35%)	62/1,946 (3.2%)
Median (IQR) CD4 percent	11.0 (6.3 to 15.4)	Not measured as >5years old
Median (IQR) weight-for-age z-score	-1.55 (-2.45 to -0.82)	-1.22 (-1.87 to -0.52)
Weight-for-age z-score <-3 (n/N; %)	228/1,574 (14.5%)	91/1,779 (5.1%)
Median (IQR) BMI-for-age z-score	-0.34 (-1.12 to 0.41)	-0.24 (-0.84 to 0.34)
BMI-for-age z-score <-3 (n; %)	49/1,314 (3.7%)	12/1,534 (0.8%)
HIV-RNA >100,000 copies/ml*	573/1,208 (47.4%)	N/A
HIV-RNA <400 copies/ml*	N/A	1,091/1,329 (82.1%)

*Only reported for children from sites with routine HIV-RNA monitoring

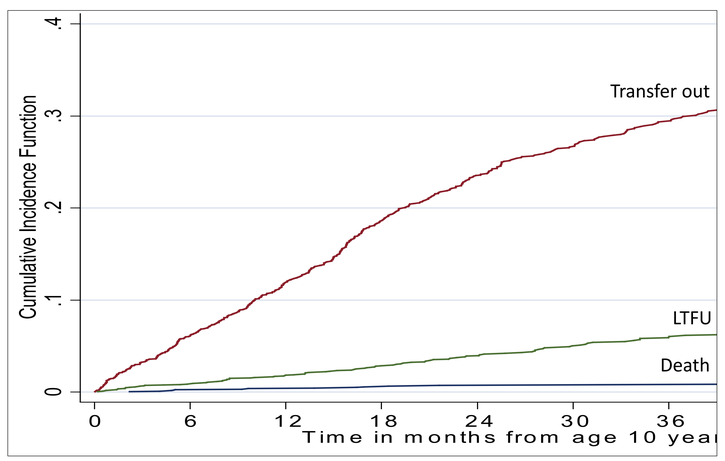

Figure 1: Cumulative incidence of death, loss to follow-up and transfer out after 10 years of age. Results from competing risks analysis.

Table 2: Characteristics of children with presumed perinatal HIV at last follow-up.

	At last follow-up visit in patients not deceased n=2,147
Female (n/N; %)	1,052/2,147 (49.0%)
Median (IQR) age in years	11.6 (10.7 to 13.1)
WHO Stage III/IV disease (n/N; %)	Not measured
Median (IQR) CD4 count (cells/µl)	764 (552 to 1,012)
CD4 <200 cells/µl (n/N; %)	45/1,878 (2.4%)
Median (IQR) BMI-for-age z-score	-0.35 (-1.01 to 0.32)
BMI-for-age z-score <-3 (n; %)	24/1,506 (1.6%)
HIV-RNA <400 copies/ml*	987/1,283 (76.9%)

*Only reported for children from sites with routine HIV-RNA monitoring

Table 3: Percentage Probability of outcomes by 13 years of age using Kaplan-Meier estimates and competing risks analysis

	K-M Probability (95%)	Cumulative Incidence (95% CI)
Death	0.8 (0.5 - 1.5)	0.7 (0.3 - 1.1)
Loss to follow-up	7.3 (5.9 - 9.1)	5.9 (4.8 - 7.3)
Transfer out	30.4 (28.0 - 32.9)	29.4 (27.0 - 31.7)
Retained	64.0 (61.4 - 66.5)	64.0 (61.4 - 66.5)

Conclusions

- **Mortality on ART is low during early adolescence in perinatally HIV-infected children who survive to 10 years of age.**
- **The majority of those in care are virologically suppressed with CD4 >200 cells/µl. However, approximately one in five children are not virologically suppressed and a similar proportion have experienced at least one episode of virologic failure.**
- **Nearly one-third of children transfer to a different program during early adolescence and their outcomes require attention.**

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