A Descriptive Retrospective Data Analysis of Maternal Sociodemographic Factors and Access of Healthcare Resources within the African Cohort Study, an Integrated Multicountry Preventative Mother to Child Transmission Program

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Background

Global reduction in new infant HIV infections is largely due to the expansion of prevention of mother-to-child transmission (PMTCT) programs[1,2]. Identification of gaps in healthcare services is paramount in targeting interventions that identify high-risk populations and healthcare barriers that could lead to increased risk of mother to child transmission (MTCT) of HIV[3,4].

This study compared access of PMTCT resources prior to and during study participation. Additionally, the impact of maternal sociodemographic factors on PMTCT resource access and infant outcomes were reviewed.

Methods

The African Cohort Study (AFRICOS) is an ongoing, multisite, prospective cohort study that enrolls HIV-infected and HIV-uninfected adults at 12 clinics from 5 US President's Emergency Plan for AIDS Relief (PEPFAR) programs in Kenya, Nigeria, Tanzania, and Uganda. Retrospective data is collected at enrollment and participants followed prospectively every 6 months.

Maternal sociodemographic factors as well as maternal access of PMTCT resources during pregnancy and after delivery were compared between retrospective and actively followed pregnancies. Factors included study site, age at delivery, education, maternal access of ART, attendance of birth by skilled birth attendant, timing of maternal HIV diagnosis, HIV diagnosis during pregnancy, and ART offered to mother or child following delivery.

Chi-square tests were used to compare sociodemographic, clinical factors to maternal and infant ART. Generalized estimating equations were used to estimate unadjusted and adjusted odds ratios (ORs) and 95% confidence intervals (95% Cis) for associations between sociodemographic/clinical factors and outcomes.

Results

Figure 1. Comparison of Access of PMTCT Resources in Retrospective vs Pregnancies During AFRICOS Enrollment

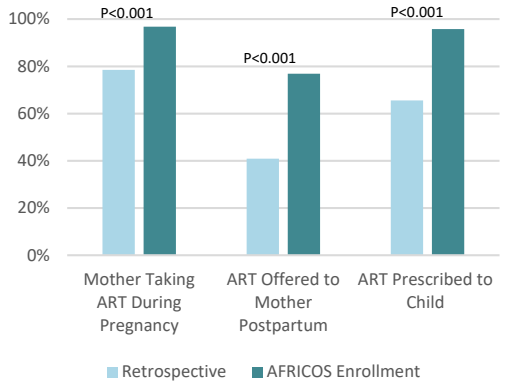

Table 2. Factors Associated with Infant Offered ART

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Site		
Kayunga, Uganda	Ref	Ref
South Rift Valley, Kenya	1.23 (0.69-2.17)	2.4 (1.13-5.07)
Kisumu West, Kenya	1.72 (0.88-3.36)	2.79 (1.42-5.49)
Mbeya, Tanzania	0.82 (0.38-1.74)	0.81 (0.34-1.91)
Abuja & Lagos, Nigeria	2.22 (0.92-5.40)	2.96 (1.20-7.32)
Skilled Birth Attendant Present		
No	Ref	Ref
Yes	5.09 (2.82-9.17)	3.99 (2.03-7.84)

Table 1. Factors Associated with Maternal ART During Pregnancy

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Maternal HIV Diagnosis		
<2006	Ref	Ref
2006-2009	1.02 (0.53-1.96)	1.03 (0.53-2.00)
2010-2012	2.23 (1.00-4.99)	2.46 (1.08-5.59)
2013-2015	3.27 (1.26-8.45)	3.86 (1.45-10.25)
Maternal HIV Diagnosis Known Prior to Pregnancy		
No	Ref	Ref
Yes	1.59 (0.95-2.67)	2.04 (1.20-3.47)
NA	0.43 (0.09-2.04)	0.57 (0.12-2.66)

Table 3. Maternal Factors Compared to Infant Outcomes- Preterm Delivery

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Maternal Education		
Primary or some secondary	0.65 (0.30-1.42)	0.58 (0.16-2.08)
Secondary and above	0.75 (0.33-1.70)	0.16 (0.05-0.55)
Timing of Maternal HIV Diagnosis		
2006-2009	1.32 (0.54-3.20)	0.92 (0.32-2.65)
2010-2012	0.33 (0.08-1.26)	0.63 (0.19-2.08)
2013-2015	1.12 (0.39-3.26)	0.87 (0.22-3.36)
2016-2017	1.53 (0.30-7.91)	0.16 (0.03-0.90)

References

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Results

- A total of 597 pregnancies were reported by HIV-infected women, 381 retrospective pregnancies and 216 followed during enrollment in AFRICOS.
- Access of PMTCT resources during pregnancy by HIV-infected women prior to AFRICOS enrollment was statistically different when compared to access of key PMTCT during enrollment (Figure 1).
- Mothers were 3.86 times more likely to be offered ART during pregnancy in 2013-2015 when compared to pregnancies with maternal diagnosis prior to 2006. This is possibly related to increased number of PMTCT clinics and increased resources over time.
- Mothers who knew their HIV diagnosis prior to pregnancy were also more likely to be offered ART during pregnancy, supporting regular screening of HIV as a part of PMTCT in order to provide resources known to improve infant outcomes.
- South Rift Valley, Kisumu West, and Abuja & Lagos sites were more likely to offer infants ART when compared to infants born at Kayunga, Uganda sites. Infants delivered with skilled birth attendants were more likely to be offered ART, also supporting that access to key healthcare resources results in improved PMTCT services for infants.
- No maternal sociodemographic factors were found to have statistically significant impacts on infant mortality.
- However, higher maternal education level was protective for infant preterm delivery and mothers diagnosed with HIV in later years, such as 2016-2017 was protective as well (Table 3.).

Conclusions

- HIV-infected women followed in AFRICOS had increased linkage to care through PMTCT programs when compared to pregnancies reported prior to enrollment.
- Women enrolled in AFRICOS had greater access to care known to improve infant outcomes and decrease MTCT of HIV.
- Access of PMTCT services provided by AFRICOS study sites, such as maternal and infant ART therapy, were associated with factors known to be protective to infants, including maternal knowledge of HIV status and skilled birthing attendants present at delivery.
- Limitations to the study were a smaller study population size and reliance on retrospectively reported data.
- This study highlights that linkage to care continues to be a crucial factor in limiting factors associated with MTCT of HIV, especially in resource limited settings.
- AFRICOS allows for comparison of practices and data sharing across multiple clinical sites in multiple countries. This study highlights the success of integrated, multicountry healthcare systems.

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