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Does delivery after 40 weeks gestation increase maternal to child transmission of HIV in well controlled HIV positive pregnancies?

The preliminary results of a secondary analysis of the NISDI/LILAC cohort

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Management of Delivery in HIV Positive Pregnancies

- Standard of care to deliver via cesarean delivery (CD) for poorly-controlled HIV at 38 weeks estimated gestational age (EGA)
- Standard of care to deliver well-controlled HIV positive pregnancies at or before 40 weeks EGA



Risks of Induction of Labor

- Prolonged labor
- Failed induction
- Cesarean delivery

- Higher rates of complications in HIV positive women
 - Infection
 - Surgical trauma
 - Extended hospitalizations
 - Death

Management of Delivery in HIV Uninfected Pregnancies

- Expectant management until induction for late term 41 weeks EGA
 - Lower rates of perinatal death
 - Lower rates of infant morbidity
 - Lower rates of cesarean section

Hypotheses and approach

1. We hypothesized that there would be no increase in MTCT associated with delivery on or after 40 weeks EGA in well controlled HIV positive pregnancies
 - Examine incidence of MTCT in deliveries between 40 and 41 weeks EGA compared to control deliveries between 38 weeks and 39 weeks and 6 days EGA
1. We hypothesized that there would be no increased maternal or neonatal morbidity or mortality associated with delivery on or after 40 weeks EGA in well controlled HIV positive pregnancies
 - Compare maternal pregnancy outcomes
 - Compare neonatal outcomes

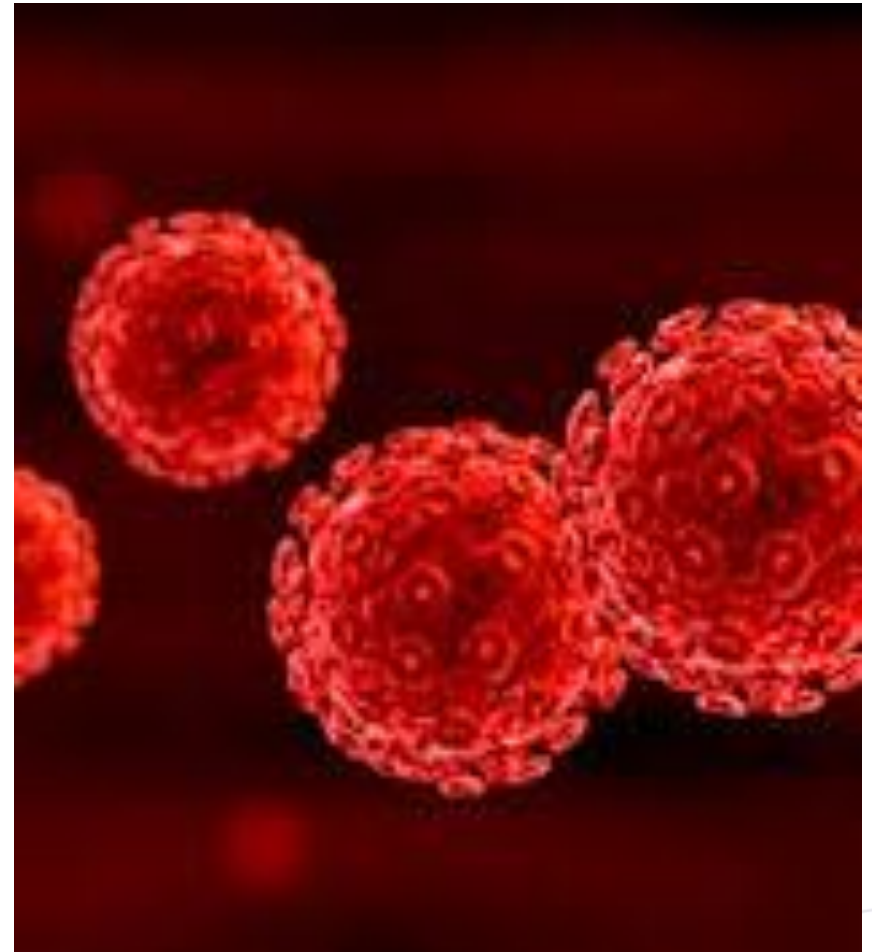
Methods: Study Design

- Secondary analysis of NICHD International Site Development Initiative (NISDI) Perinatal/Longitudinal Study in Latin American Countries (LILAC)
- Matched cohorts of HIV positive pregnancies <40 weeks EGA compared to ≥ 40 weeks



Definitions:

- Well controlled HIV:
Viral load (VL) less than 1000
- Pregnancies <40 weeks EGA: 38w0d-39w6d
- Pregnancies \geq 40 weeks EGA: 40w0d-41w0d
- Gestational age determined by:
 - Capurro
 - Obstetrical estimate
 - Pediatric newborn exam (Ballard)

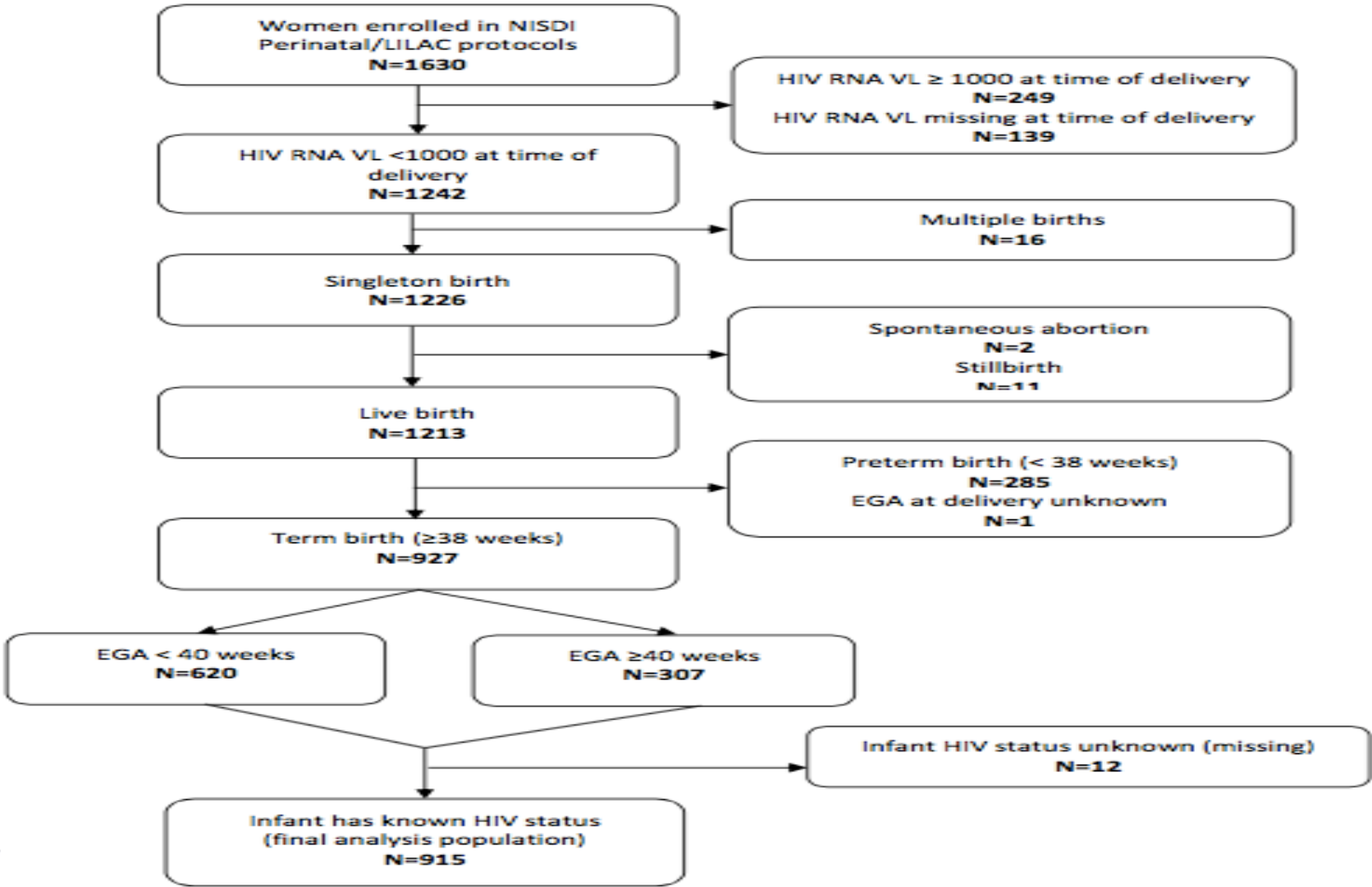


Methods: Statistical Analysis

- Associations between EGA and outcomes were examined through bivariate analyses, with Fisher's exact or Wilcoxon nonparametric p-values
- We plan to use mixed model methods for continuous outcome measures and bivariate conditional logistic regressions for categorical outcome measures
- We plan to use multivariate conditional logistic regression and mixed models that can control for the correlations among the matched observations for our modeling analyses



Results: Study population



Results: Maternal Demographics

| | <40 weeks EGA N= 612 | ≥40 weeks EGA N= 303 | P-value |
|--------------------------|----------------------------|----------------------------|---------|
| Maternal Age in Years | 28.1 | 28.6 | 0.32 |
| HIV VL | 156.9 | 141.2 | 0.15 |

Results

Maternal to Child Transmission



Results: Neonatal HIV Status

| | Pregnancies <40 weeks EGA N = 612 | Pregnancies ≥40 weeks EGA N= 303 |
|-------------------------|--|---|
| Indeterminate: | 32 (5.2%) | 14 (4.6%) |
| Presumed uninfected: | 3 (0.5) | 1 (0.3%) |
| Uninfected: | 573 (93.6%) | 286 (94.4%) |
| HIV-infected: | 4 (0.7%) | 2 (0.7%) |

p=1.00

Results:

Maternal Pregnancy Outcomes



Results: Mode of Delivery

| | >40 weeks EGA N= 612 | <40 weeks EGA N= 303 |
|------------------|-------------------------|-------------------------|
| Vaginal Delivery | 224 (36.6) | 176 (58.1) |
| Elective CD | 276 (45.1) | 76 (25.1) |
| Non-elective CD | 111 (18.1) | 51 (16.8) |
| Unknown | 1 (0.2) | 0 (0.0) |

p <.0001

Results: Indication for Cesarean Delivery

| | <40 weeks N=387 N (%)* | ≥40 weeks N=127 N (%) |
|------------------------------------|------------------------------|-----------------------------|
| Prevention of HIV Infection | 158 (40.8) | 52 (40.9) |
| Repeat Cesarean Section | 95 (24.5) | 19 (15.0) |
| Non-Reassuring Fetal Heart Rate | 15 (3.9) | 12 (9.4) |
| Prolonged Rupture Of Membranes | 17 (4.4) | 9 (7.1) |
| Patient Desires Sterilization | 17 (4.4) | 0 (0.0) |
| Failed Induction** | 13 (3.4) | 8 (6.3) |
| Patient Request | 20 (5.2) | 2 (1.6) |
| Cephalopelvic Disproportion | 17 (4.4) | 6 (4.7) |
| Malpresentation | 8 (2.1) | 4 (3.1) |
| Active Or Recent Genital Infection | 6 (1.6) | 4 (3.1) |

**p=0.1929

Results: Other Maternal Outcomes

- No difference in length of stay
- No maternal deaths
- Post-partum and post-operative complications too rare to draw any conclusions at this time

Results:

Neonatal Outcomes



February 21, 2016

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Results: Neonatal Outcomes

- Higher proportion of neonates born <40 weeks EGA were low birth weight (LBW) (8.2%) compared to ≥ 40 weeks EGA (4.0%, $p = 0.0173$)
- Other neonatal complications too rare to draw any conclusions at this time

Summary

- Risk of MTCT did not differ by EGA
 - Not powered to demonstrate rates were equivalent
 - Challenges current standard of care
- We will complete multivariate logistic regression to better understand the increased LBW and indications for elevated CD in pregnancies which delivered <40 weeks EGA
- No difference in other maternal and neonatal outcomes
 - Not powered to demonstrate rates were equivalent

Limitations and Next Steps

- Underpowered to draw any conclusions regarding differences MTCT in pregnancies <40 weeks vs. ≥40 weeks EGA
- We are currently working to incorporate the International Maternal Pediatric Adolescent AIDS Clinical Trials (IMPAACT) P1025 data into the analysis for our primary and secondary outcomes of interest

Acknowledgements

Principal investigators, co-principal investigators, study coordinators, coordinating center representatives, and NICHD staff include:

- **Argentina: Buenos Aires:** Marcelo H. Losso, Irene Foradori, Alejandro Hakim, Erica Stankievich, Silvina Ivalo (Hospital General de Agudos José María Ramos Mejía)
- **Brazil:**
 - **Belo Horizonte:** Jorge A. Pinto, Victor H. Melo, Fabiana Kakehasi, Beatriz M. Andrade (Universidade Federal de Minas Gerais)
 - **Caxias do Sul:** Rosa Dea Sperhackle, Nicole Golin, Sílvia Mariani Costamilan (Universidade de Caxias do Sul/ Serviço Municipal de Infectologia)
 - **Nova Iguacu:** Jose Pilotto, Luis Eduardo Fernandes, Gisely Falco (Hospital Geral Nova de Iguacu - HIV Family Care Clinic)
 - **Porto Alegre:** Rosa Dea Sperhackle, Breno Riegel Santos, Rita de Cassia Alves Lira (Universidade de Caxias do Sul/Hospital Conceição); Rosa Dea Sperhackle, Mario Ferreira Peixoto, Elizabete Teles (Universidade de Caxias do Sul/Hospital Fêmeina); Regis Kreitchmann, Luis Carlos Ribeiro, Fabrizio Motta, Debora Fernandes Coelho (Irmandade da Santa Casa de Misericórdia de Porto Alegre)
 - **Ribeirão Preto:** Marisa M. Mussi-Pinhata, Geraldo Duarte, Adriana A. Tiraboschi Bárbaro, Conrado Milani Coutinho, Fabiana Rezende Amaral, Anderson Sanches de Melo (Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto da Universidade de São Paulo)
 - **Rio de Janeiro:** Ricardo Hugo S. Oliveira, Elizabeth S. Machado, Maria C. Chermont Sapia (Instituto de Puericultura e Pediatria Martagão Gesteira); Esau Custodio Joao, Leon Claude Sidi, Maria Leticia Santos Cruz, Maria Isabel Gouvêa, Mariza Curto Saavedra, Clarisse Bressan, Fernanda Cavalcanti A. Jundi (Hospital dos Servidores do Estado)
 - **São Paulo:** Regina Celia de Menezes Succi, Prescilla Chow (Escola Paulista de Medicina- Universidade Federal de São Paulo);
- **Peru: Lima:** Jorge O. Alarcón Villaverde (Instituto de Medicina Tropical “Daniel Alcides Carrión”- Sección de Epidemiología, UNMSM), Carlos Velásquez Vásquez (Instituto Nacional Materno Perinatal), César Gutiérrez Villafuerte (Instituto de Medicina Tropical “Daniel Alcides Carrión”- Sección de Epidemiología, UNMSM)
- **Data Management and Statistical Center:** Yolanda Bertucci, Rachel Cohen, Laura Freimanis Hance, René Gonin, D. Robert Harris, Roslyn Hennessey, James Korelitz, Margot Krauss, Sue Li, Karen Megazzini, Orlando Ortega, Sharon Sothern de Sanchez, Sonia K. Stoszek, Qilu Yu (Westat, Rockville, MD, USA); **NICHD:** George K. Siberry, Rohan Hazra, Lynne M. Mofenson (*Eunice Kennedy Shriver* National Institute of Child Health and Human Development, Bethesda, Maryland, USA).

Supported by NICHD Contracts N01-HD-3-3345 (2002-2007), HHSN267200800001C (2007-2012), and HHSN275201300003C (2012-2017).

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