High body mass in HIV+ & HIV- women and their HIV-uninfected infants in South Africa

Angela M. Bengtson[1], Stanzi M. le Roux[2], Tamsin K. Phillips[2,3], Kirsty Brittain[2,3], Allison Zerbe[4], Thokozile Malaba[2], Gregory Petro[5] , Hlengiwe Madlala[2], Elaine J. Abrams[4,6], Landon Myer[2,3]

[1]Department of Epidemiology, Brown University; [2]Division of Epidemiology and Biostatistics, University of Cape Town; [3]Centre for Infectious Disease Epidemiology & Research, University of Cape Town; [4]ICAP at Columbia University, Columbia University; [5]Department of Obstetrics & Gynaecology, University of Cape Town and New Somerset Hospital; [6]Department of Pediatrics, Vagelos College of Physicians & Surgeons, Columbia University

00801

Overview

We followed a cohort of HIV-exposed, uninfected and HIV-unexposed infants from birth through 12 months postpartum. We examined how maternal HIV-status and pre-pregnancy BMI affected infant BMIZ scores and risk of being overweight through 1 year of age.

Background

- HIV-exposed uninfected (HEU) infants may have altered growth relative to HIV-unexposed (HU) infants.
- Maternal body mass index (BMI) and obesity are strongly linked to child growth.
- There are few data on associations between maternal BMI and HEU infant weight or obesity.

Methods

Setting

- Guguletu Maternity Clinic in Cape Town, South Africa
- High levels of HIV & obesity in pregnancy

Study Design

- Prospective cohort
- Enrolled at entry into antenatal care and followed through at least 12 months postpartum

Study Population

- Mother-infant pairs: N=780
  - HEU N=383
  - HU N=397
  - Excluded: HIV-infected infants (n=12)
- HIV-infected mothers initiated ART (TDF+XTC+EFV) in pregnancy & were breastfeeding at first postpartum visit
- HIV-infected women enrolled in MCH-ART Trial

Statistical Analysis:

- Combined exposure of maternal HIV/ART (HIV+ vs HIV-) and pre-pregnancy BMI (not overweight (BMI<25) vs overweight/ obese (BMI ≥25))
- Estimated mean infant BMIZ scores using multivariable linear mixed models and the probability of infant overweight (BMIZ >2 SD) using modified Poisson regression

Results

Figure 1. Study Population

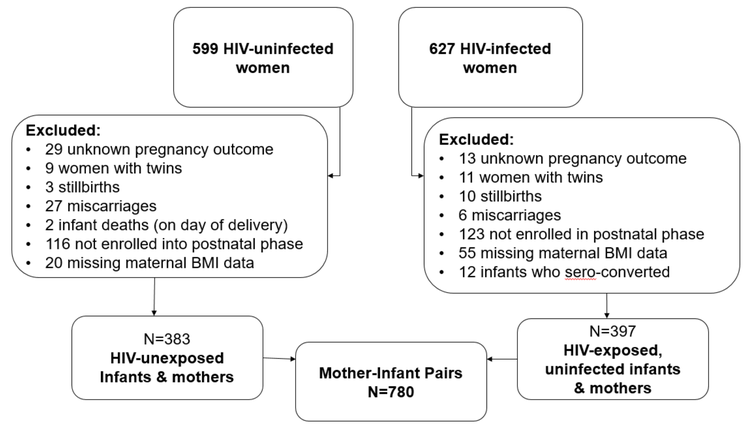
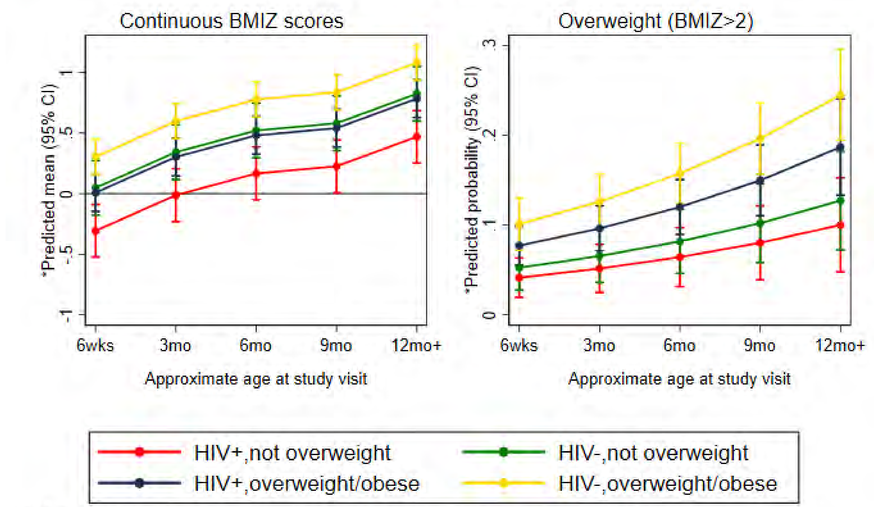


Figure. Body mass index-for age Z-scores (BMIZ) among HIV-uninfected children by maternal HIV and pre-pregnancy BMI status



*All models adjusted for poverty alcohol food insecurity education and maternal age.

Table 1. Selected Study Population Characteristics

Characteristic	All HIV-uninfected infants	HIV-exposed uninfected infants	HIV-unexposed infants
	N=780	N=383	N=397
		Median (IQR)	
Maternal age	28 (24, 32)	28 (24, 32)	27 (23, 32)
Gravidity	2 (2, 3)	2 (2, 3)	2 (2, 3)
Gestational age, weeks	20 (14, 26)	20 (15, 26)	19 (13, 26)
Pre-pregnancy BMI category		N (%)	
Underweight, <18.5	29 (3.7)	17 (4.4)	12 (3.0)
Normal weight, 18.5-<25	219 (28.1)	116 (20.3)	103 (25.9)
Overweight, 25-<30	214 (27.4)	111 (29.0)	103 (25.9)
Obese I, 30-<35	152 (19.5)	69 (18.0)	83 (20.9)
Obese II, 35-<40	104 (13.3)	44 (11.5)	60 (15.1)
Obese III, ≥40	62 (7.9)	26 (6.8)	36 (9.1)
Alcohol use			
Below threshold	655 (84.1)	286 (74.9)	369 (92.9)
Hazardous drinking	124 (15.9)	96 (25.1)	28 (7.1)
Food Insecurity Scale			
None	416 (63.3)	179 (56.5)	237 (69.7)
At Risk	176 (26.8)	84 (26.5)	92 (27.1)
Food Insecurity	65 (9.9)	54 (17.0)	11 (3.2)
Breastfeeding			
< 6 months	363 (46.5)	213 (55.6)	150 (37.8)
≥ 6 months	417 (53.5)	170 (44.4)	247 (62.2)

Proportion of Infants Overweight (BMIZ>2) by 12 months*:

HIV+, not overweight: **12%**
HIV+, overweight/obese: **14%**

HIV-, not overweight: **20%**
HIV-, overweight/obese: **21%**

*Among 613 participants with a measure at 12 months postpartum

Conclusions

- In the first year of life, **HEU infants had lower mean BMI** than HU infants, regardless of maternal BMI status.
- By 12 months postpartum, the **probability of being overweight was ≥10%** for all infants, regardless of HIV-BMI category.
- However, **infants born to overweight/obese women**, compared to not overweight women, **were more likely to be overweight**, regardless of HIV status.
- Future research should examine if maternal HIV and BMI status increase the risk of cardio-metabolic complications for HEU infants later in life.

School of Public Health and Family Medicine
Isikolo Sempilo Yoluntu kunye Namayeza Osapho
Departement Openbare Gesondheid en Huisartskunde
UNIVERSITY OF CAPE TOWN

ICAP Columbia University Mailman School of Public Health

: Angela_Bengtson@brown.edu
: @BengtsonAngie

This research was supported by the President's Emergency Plan for AIDS Relief (PEPFAR) through the National Institute of Child Health and Human Development (NICHD; Grant Number 1R01HD074558) and was supported through the National Institute of Mental Health (NIMH; Grant Number R00MH112413). Additional funding comes from the Elizabeth Glaser Pediatric AIDS Foundation, South African Medical Research Council (Clinician-Researcher PhD Scholarship), the Fogarty Foundation (NIH Fogarty International Center; Grant Number 5R25TW009340) and the Office of AIDS Research.