

Nutrition, Growth and Metabolism Working Group summary of publications: Presentation to CAB July 27, 2017

HEU

Safety of tenofovir use during pregnancy: early growth outcomes in HIV-exposed uninfected infants.

Siberry GK, et al. AIDS 2012

TDF use during pregnancy was not associated with increased risk for low birth weight or small for gestational age. The slightly lower mean length and head circumference observed at age 1 year in tenofovir-exposed infants are of uncertain significance but underscore the need for additional studies of growth outcomes after tenofovir use during pregnancy

Growth at 2 Years of Age in HIV-exposed Uninfected Children in the United States by Trimester of Maternal Antiretroviral Initiation.

Jacobson DL, et al
Pediatr Infect Dis J. 2017

Growth was above average in HEU; 13% were obese. Maternal tenofovir use was not associated with lower length or head circumference at 2 years of age, as hypothesized, but may be related to greater weight among those exposed to cART early in pregnancy.

Lower Newborn Bone Mineral Content Associated With Maternal Use of Tenofovir Disoproxil Fumarate During Pregnancy.

Siberry GK, et al.
Clin Infect Dis. 2015

Maternal tenofovir use is associated with significantly lower neonatal bone mineral content. The duration and clinical significance of this finding should be evaluated in longitudinal studies.

A multicenter study of diet quality on birth weight and gestational age in infants of HIV-infected women.

Miller TL, et al.
Matern Child Nutr. 2016

Diet quality among HIV+ women is associated with higher birth weight. Despite the influence of a large cultural effect (women born outside of the US had a

better diet) and poor prenatal behaviors (substance use was associated with poor diet quality), interventions to improve diet in HIV+ women may help to increase birth weight.

HIV – metabolic and cardiovascular

Metabolic abnormalities and viral replication are associated with biomarkers of vascular dysfunction in HIV-infected children.

Miller, TL, et al.
HIV Med 2012 May;13(5):264-75.

HIV-infected children have higher levels of biomarkers of vascular dysfunction than do HEU children. Risk factors associated with higher biomarkers include unfavourable lipid levels and active HIV replication.

Body fat distribution in perinatally HIV-infected and HIV-exposed but uninfected children in the era of highly active antiretroviral therapy: outcomes from the Pediatric HIV/AIDS Cohort Study.

Jacobson DL, et al.
Am J Clin Nutr. 2011

Although body mass index and total body fat were significantly lower in the HIV-infected children than in the HEU children, body fat distribution in the HIV-infected children followed a pattern associated with cardiovascular disease risk and possibly related to specific antiretroviral drugs.

Factors associated with insulin resistance among children and adolescents perinatally infected with HIV-1 in the pediatric HIV/AIDS cohort study.

Geffner ME et al.
Horm Res Paediatr. 2011

In our cohort of HIV-infected adolescents, we observed a 15.2% prevalence of insulin resistance (pre-diabetes) more closely linked to obesity than any other variable. This finding mirrors the high prevalence of obesity-mediated insulin resistance in American youth. However, associations with CD4 count and use of protease inhibitors may indicate some effect of HIV and/or its treatment.

Changes in Insulin Sensitivity over Time and Associated Factors in HIV-Infected Adolescents

Geffner ME, et al. (revise and resubmit for AIDS)

High prevalence of insulin resistance (pre-diabetes) found in both PHIV+ and PHEU was similar to that seen in healthy obese youth suggesting neither HIV infection nor its treatment impact insulin resistance. Factors associated with both new or resolved insulin resistance were similar to those reported in HIV-negative obese youth.

Insulin resistance in HIV-infected youth is associated with decreased mitochondrial respiration.

Takemoto JK et al.
AIDS. 2017

HIV-infected youth with insulin resistance (pre-diabetes) have lower mitochondrial respiration markers (poorly functioning mitochondria – powerhouse of the cell) when compared to youth without insulin resistance. Disordered mitochondrial respiration may be a potential mechanism for insulin resistance in this population.

Short communication: The relationship between mitochondrial dysfunction and insulin resistance in HIV-infected children receiving antiretroviral therapy.

Sharma TS et al.
AIDS Res Hum Retroviruses. 2013

Mitochondrial DNA copies/cell tended to be lower in cases (those with pre-diabetes), and higher serum glucose levels were significantly correlated with worse C1 enzyme activity of mitochondria, more so in cases.

Aggregate risk of cardiovascular disease among adolescents perinatally infected with the human immunodeficiency virus.

Patel K et al.
Circulation 2014

A substantial proportion of perinatally HIV-infected youth have high PDAY scores, reflecting increased aggregate atherosclerotic cardiovascular disease risk factor burden. High scores were predicted by HIV disease severity and boosted protease inhibitor use. PDAY scores may be useful in identifying high-risk youth who may benefit from early lifestyle or clinical interventions.

Improvement in Lipids after Switch to Boosted Atazanavir or Darunavir in Children/Adolescents with Perinatally Acquired HIV on Older Protease Inhibitors: Results from the PHACS Adolescent Master Protocol Study

Jao, J., et al.
HIV Medicine - submitted

Switch to atazanavir/ritonavir or daurunavir/ ritonavir may result in more rapid improvement in total cholesterol and total cholesterol/HDL in PHIV youth, potentially impacting long-term cardiovascular disease risk.

HIV – Bone

Bone mineral density in children and adolescents with perinatal HIV infection.

DiMeglio LA et al
AIDS 2013

Rates of low bone mineral density in HIV+ children were greater than expected based on normal population distributions. These differences were partially explained by delays in growth. As most HIV+ children in this study had not entered their pubertal growth spurt, prepubertal factors associated with bone density, magnified or carried forward, may result in sub-optimal peak bone density in adulthood.

Associations of Low Vitamin D and Elevated Parathyroid Hormone Concentrations with Bone Mineral Density in Perinatally HIV-Infected Children

Jacobson, DL. et al.
JAIDS, in press.

PHIV and PHEU children with low 25(OH)D may have lower BMD. Vitamin D supplementation trials during critical periods of bone accrual are needed.