Background/Hypothesis: Leptin is positively associated with adiposity at birth and may vary by sex. Whether cord blood leptin is associated with long term adiposity is unclear. We hypothesized that cord blood leptin is positively associated with adiposity measures in peripubertal children and that the association differs by sex.

Methods: Data from mother-child pairs in an ethnically and racially diverse prospective birth cohort were used for analysis. Leptin was measured in 990 stored cord blood samples using Millipore ELISA assays. Adiposity measures from children (mean age 11.5 ± SD 1.1 years) included body mass index (BMI), sum of three skinfolds (SSF), waist circumference (WC), and fat mass and body fat percent by air-displacement plethysmography (ADP/BOD POD). Leptin levels were log transformed to improve normality. Linear and logistic regression were used to evaluate associations between cord blood leptin and childhood adiposity outcomes for continuous and categorical variables, respectively. Statistical models accounted for covariates: Model 1 [child age, sex, field center and maternal pregnancy variables (age, parity, smoking status, drinking status, gestational age at oral glucose tolerance test (OGTT), mean arterial pressure at OGTT, family history of diabetes)] and Model 2 [Model 1+ maternal mid-pregnancy BMI + maternal gestational diabetes (present/absent)]. In Model 1, statistical interaction terms were also included to evaluate whether associations between cord blood leptin and adiposity outcomes varied by sex. Statistical significance was determined by p<0.05 for all statistical tests.

Results: Cord blood leptin was positively associated with all childhood adiposity outcomes. Associations did not vary by child sex. Associations were attenuated in Model 2, but remained statistically significant. For log-cord blood leptin higher by one SD, continuous childhood adiposity outcomes were higher as follows: BMI: Model 1, beta coefficient 0.57 kg/m² (95% CI 0.29-0.86), Model 2, 0.31 kg/m² (95% CI 0.03-0.59); fat mass: 1.18 kg (0.66-1.71), 0.76 kg (0.23-1.29); body fat percent: 1.69% (1.02-2.36), 1.23% (0.56-1.91); SSF: 2.98 mm (1.56-4.41), 1.99 mm (0.56-3.43); and WC >85th percentile: 1.38 (1.15-1.66), 1.22 (1.01-1.48). Leptin was associated with SSF >85th percentile in Model 1 1.32 (1.10-1.59) but not Model 2. Leptin was not associated with child fat-free mass.

Conclusion: Cord blood leptin is positively associated with peripubertal offspring adiposity, independent of maternal BMI and gestational diabetes. The relationship between cord blood leptin and peri-pubertal adiposity did not differ by sex.

Presentation: Saturday, June 11, 2022 1:36 p.m. - 1:41 p.m., Sunday, June 12, 2022 12:30 p.m. - 2:30 p.m.