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Associations between birth weight and body fat and insulin outcomes among children.

ABSTRACT

There has been a world-wide increase in health problems related to adverse metabolic outcomes. Previous studies have found that a lower birth weight is associated with progression to type-2 diabetes and obesity. In this study we seek to determine if there is a relationship between birth weight, genetic admixture and metabolic outcomes. We conducted this study among 314 healthy children between the ages of 7-12, and from three different ethnic groups (African-, European-, and Hispanics-Americans). We examined various measures of metabolic outcomes: total body fat, insulin sensitivity (SI), acute insulin response to glucose (AIRg), cholesterol (HDL & LDL), using as predictors birth weight, maternal age, and the child's genetic admixture based on 142 ancestry informative markers (AIMs). We observe that African Americans have a lower average birth weight compared to European- and Hispanic-Americans. We find a significant negative relationship between birth weight and the African and Native Americans admixture, and a significant positive relationship between birth weight and European Americans admixture. We also find that birth weight is a significant predictor of total body fat and acute insulin response to glucose, showing a positive relationship in each case. Our findings show that there are racial differences in birth weight that might be related to genetic factors, and that high birth weight could be a risk factor for future metabolic outcomes.