Adiposity, Dysmetabolic Traits, and Earlier Onset of Female Puberty in Adolescent Offspring of Women With Gestational Diabetes Mellitus: A Clinical Study Within the Danish National Birth Cohort - DTU Orbit (02/03/2019)

OBJECTIVE:
Offspring of pregnancies affected by gestational diabetes mellitus (GDM) are at increased risk of the development of type 2 diabetes. However, the extent to which these dysmetabolic traits may be due to offspring and/or maternal adiposity is unknown. We examined body composition and associated cardiometabolic traits in 561 9- to 16-year-old offspring of mothers with GDM and 597 control offspring.

RESEARCH DESIGN AND METHODS:
We measured anthropometric characteristics; puberty status; blood pressure; and fasting glucose, insulin, C-peptide, and lipid levels; and conducted a DEXA scan in a subset of the cohort. Differences in the outcomes between offspring of mothers with GDM and control subjects were examined using linear and logistic regression models.

RESULTS:
After adjustment for age and sex, offspring of mothers with GDM displayed higher weight, BMI, waist-to-hip ratio (WHR), systolic blood pressure, and resting heart rate and lower height. Offspring of mothers with GDM had higher total and abdominal fat percentages and lower muscle mass percentages, but these differences disappeared after correction for offspring BMI. The offspring of mothers with GDM displayed higher fasting plasma glucose, insulin, C-peptide, HOMA-insulin resistance (IR), and plasma triglyceride levels, whereas fasting plasma HDL cholesterol levels were decreased. Female offspring of mothers with GDM had an earlier onset of puberty than control offspring. Offspring of mothers with GDM had significantly higher BMI, WHR, fasting glucose, and HOMA-IR levels after adjustment for maternal prepregnancy BMI, and glucose and HOMA-IR remained elevated in the offspring of mothers with GDM after correction for both maternal and offspring BMIs.

CONCLUSIONS:
In summary, adolescent offspring of women with GDM show increased adiposity, an adverse cardiometabolic profile, and earlier onset of puberty among girls. Increased fasting glucose and HOMA-IR levels among the offspring of mothers with GDM may be explained by the programming effects of hyperglycemia in pregnancy.
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