

Obesity and gestational diabetes in mothers linked to early onset of puberty in daughters

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Daughters of overweight mothers who develop gestational diabetes are significantly more likely to experience an earlier onset of one sign of puberty, according to new Kaiser Permanente research published in the *American Journal of Epidemiology*.

Research has shown that American [girls](#) are maturing earlier now than they were a few decades ago, and that early puberty increases the risk of adverse health outcomes, including [obesity](#), type 2 diabetes, [polycystic ovarian syndrome](#), and cancer in adolescence and adulthood. This study is based on long-term research on an ethnically diverse sample of 421 girls and their mothers (all members of Kaiser Permanente in Northern California) participating in the Cohort study of Young Girls' Nutrition, Environment, and Transitions (known as CYGNET).

"Very few previous studies have examined the association between maternal pregnancy or pre-pregnancy factors and the timing of puberty in daughters. Understanding what causes earlier onset of puberty is important in designing prevention strategies," explained Ai Kubo, MPH, PhD, the study's lead author and an epidemiologist at the Kaiser Permanente Division of Research. "Women who are planning on becoming pregnant or are pregnant should be aware that their obesity or [gestational diabetes](#) may influence their child's health in the future, beyond the known risk of childhood obesity."

The girls were followed from 2005 to 2012, with annual clinic visits to measure each girl's height, weight and other parameters. Trained

personnel assessed the onset of puberty by physical examination during study clinic visits. Researchers found that girls whose mothers were overweight before their pregnancy and had gestational diabetes were 2.5 times more likely to have earlier onset pubic hair development than their peers whose mothers had normal weight and no gestational diabetes. This association was independent of race or ethnicity, household income and the mother's age at her first menstrual cycle.

"This research builds on our long-term study of puberty development in girls, which has been underway since the girls were between 6 and 8 years old, and the pairing of their data with information in Kaiser Permanente's electronic medical records about their [mothers](#)," said Lawrence H. Kushi, ScD, the study's senior author and CYGNET principal investigator at the Kaiser Permanente Division of Research.

The study adds to the previous analyses of CYGNET data, which showed that [maternal obesity](#) and gestational diabetes were linked to obesity in daughters, and that obesity was linked to [early puberty](#) in the girls. This newest study found that in utero exposure to gestational diabetes and maternal obesity was associated with earlier arrival of [puberty](#) in daughters, regardless of the girl's obesity status. The finding suggests that metabolic programming may be affected in the daughters, which can manifest in the early onset of pubic hair development, a marker of metabolic impairment.

Provided by Kaiser Permanente

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