

PRESS RELEASE

EMBARGOED UNTIL 12 MAY 2026 AT 11:30 CEST

Insulin resistance during pregnancy linked to higher abdominal fat in girls

Girls born to mothers with higher insulin resistance during the third trimester are more likely to have more abdominal fat at age 7, according to research presented at the 28th European Congress of Endocrinology in Prague. Maternal insulin resistance was not associated with body fat in boys, suggesting that girls may be more susceptible to the mother's insulin resistance during late pregnancy. The findings highlight the importance of maternal metabolic health for the future wellbeing and health of children.

During pregnancy, the body needs much more insulin after the first trimester due to hormonal changes in the placenta. Insulin resistance peaks in the third trimester of pregnancy – typically around weeks 32-36. Early life exposure to different hormones can shape long-term health in children.

In this study, researchers from the Odense University Hospital in Denmark analysed data on insulin resistance, fasting blood sugar and insulin levels of 903 women during their third trimester of pregnancy, from the Odense Child Cohort. They also measured the body composition of 903 children aged 7 years and found that girls exposed to higher insulin resistance in the womb had more fat around the central trunk and upper body, around the lower body, and more total body fat. In addition, every 1 mmol/L higher maternal fasting blood sugar level was associated with about a 6% higher body fat percentage in girls. These findings held irrespective of the mother's pre-pregnancy weight.

Though previous studies have shown an association between maternal blood sugar levels and children's body fat mass, there are inconsistent results on the differences between boys and girls. "Our findings indicate that girls may be more susceptible than boys to the effects of maternal insulin resistance during pregnancy. In boys, more body fat was primarily explained by the mother's BMI, whereas in girls, the specific metabolic environment in the womb – independent of the mother's weight – seems to play a larger role," said Dr Camilla Viola Palm, who was involved in the study.

Dr Palm added: "Our study contributes new insight by using measures of insulin resistance in the third trimester and DXA scans to assess fat distribution in 7-year-old children. In addition, the participating mothers and health professionals had no knowledge of the glucose and insulin assessments, which ensured that the results were not influenced by any changes in diet or medical treatment".

"The pregnant women in our study were relatively lean and healthy, suggesting that even in mothers without metabolic risk, higher insulin resistance during pregnancy may programme future abdominal fat deposition in their girls," said Dr Palm. "Extra abdominal fat may increase the girls' risk of developing type 2 diabetes and cardiovascular disease later in life, thus maternal insulin resistance should ideally be addressed early in pregnancy – or ideally prior to conception."

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Abstract

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Higher maternal third trimester insulin resistance is linked to central fat deposition in 7-year-old girls. An Odense Child Cohort study.

Introduction: Maternal Insulin resistance is evident in third trimester and may have intergenerational effects on child fat deposition. More central fat in children has been associated with increased cardiovascular risk. Furthermore, there may be sexual dimorphism regarding susceptibility to pre-gestational metabolic environment.

Objectives: To examine associations between maternal third trimester insulin resistance, glucose status and child body composition, including gynoid and android fat deposition, in 7-year-old girls and boys.

Methods: 903 mother-child pairs (girls, n=449) were included from the Odense Child Cohort. third trimester insulin resistance, homeostatic model assessment-insulin resistance (HOMA-IR), fasting plasma glucose (FPG), insulin, and HbA1c and first trimester HbA1c were measured. Child Dual X-ray Absorptiometry (DXA)-assessed body composition (total, android and gynoid fat mass) were estimated at 7 years. Participants and health professionals were blinded for maternal FPG, insulin and HbA1c results.

Results: In girls, a doubling in third trimester HOMA-IR was associated with a 7.1% ($P=0.02$), 1.1% ($P=0.008$) and 4% ($P=0.008$) increase in android, gynoid and total fat mass percentages, respectively. One mmol/L higher maternal FPG was associated with 6.1% ($P=0.02$) higher fat mass percentage in girls. Associations between third trimester HOMA-IR, FPG, insulin, HbA1c and child fat mass percentage were positive in girls (All $P\leq 0.02$) and boys ($P=0.14, 0.07, 0.19$ and 0.15 , respectively), but only significant in girls.

Conclusions: Insulin resistance in third trimester was linked to more central fat in 7-year-old girls, suggesting higher susceptibility to insulin resistance in girls compared to boys.

Notes for Editors:

1. For press enquiries, or to arrange an interview with the study authors, please contact the ECE 2026 Press Office:

Julianna Photopoulos

Mob: +44 (0) 777 2264482

Email: media@ese-hormones.org

2. The study '**Higher maternal third trimester insulin resistance is linked to central fat deposition in 7-year-old girls. An Odense Child Cohort study**' will be presented on **Tuesday 12 May 2026, 11:30 - 11:35 CEST**, at the European Congress of Endocrinology at the Prague Congress Centre (PCC) in the Czech Republic.
3. The 28th European Congress of Endocrinology (ECE) is held at the Prague Congress Centre (PCC) in the Czech Republic, on 9-12 May 2026. See the full scientific programme [here](#).
4. The [European Society of Endocrinology](#) (ESE) provides a platform to develop and share leading research and best knowledge in endocrine science and medicine. By uniting and representing every part of the endocrine community, we are best placed to improve the lives of patients. With over 5,400 individual members and through the 50 National Societies involved with the ESE Council of Affiliated Societies (ECAS) ESE represents a community of over 20,000 European endocrinologists. We inform policy makers on health decisions at the highest level through advocacy efforts across Europe.