

Study links child obesity at age 9-11 years to gestational diabetes in mother

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New research published in *Diabetologia* (the journal of the European Association for the Study of Diabetes [EASD]) shows an increased risk of childhood obesity at age 9-11 years when the mother has had gestational diabetes during pregnancy. The study is by Dr Gang Hu, Pennington Biomedical Research Center, Baton Rouge, LA, USA, and colleagues.

Childhood obesity has increased dramatically in both developed and developing countries. It has been suggested that prenatal, perinatal and postnatal environmental factors impact [childhood obesity](#). Some studies have found that intrauterine exposure to maternal gestational diabetes mellitus (GDM) places offspring at increased risk of long-term adverse outcomes, including obesity.

This new analysis is based on The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE), which is a multinational cross-sectional study conducted at urban and suburban sites in 12 countries. Although the study includes 7372 children, after excluding children with incomplete data, there were 4740 children remaining; each of the 12 countries had the following numbers of children aged 9-11 years included: Australia 386, Brazil 354, Canada 443, China 413, Colombia 700, Finland 401, India 414, Kenya 289, Portugal 533, South Africa 120, the UK 324 and the USA 363.

Maternal GDM was diagnosed according to the American Diabetes Association (ADA) or WHO criteria. Height and waist circumference

were measured using standardised methods. Weight and [body fat](#) were measured using a portable body composition analyser.

The prevalence of reported maternal GDM was 4.3%. The overall prevalence of childhood obesity, central obesity and high body fat was 12.3%, 9.9% and 8.1%, respectively. The authors then used computer modelling adjusted for various factors (maternal age at delivery, education, infant feeding mode, gestational age, number of younger siblings, child unhealthy diet pattern scores, moderate-to-vigorous physical activity, sleeping time, sedentary time, sex and birthweight).

The increased risk for children of GDM mothers compared with non-GDM mothers was 53% for obesity, 73% for central obesity, and 42% for high body fat. The positive association was still statistically significant for central obesity (54% increased risk) after additional adjustment for current maternal BMI but was no longer significant for obesity and high body fat.

The authors say: "The mechanisms by which exposure to diabetes in the womb increases the risk of offspring obesity are not fully understood. Exposure to maternal diabetes is associated with excess fetal growth in utero, possibly mainly due to an increase in fetal fat mass and alterations in fetal hormone levels. In addition, exposure to maternal diabetes results in higher levels of blood sugar, insulin and leptin in offspring. Maternal prenatal GDM may also influence fetal genetics, thereby influencing the expression of genes that direct the accumulation of body fat or related metabolism."

They conclude: "Our study is the first to evaluate the association between maternal GDM and childhood obesity using such widespread, multinational data. We found that maternal GDM was associated with an increased risk of childhood obesity among children aged 9-11 years from 12 countries, but this association was not fully independent of

maternal BMI."

More information: Pei Zhao et al. Maternal gestational diabetes and childhood obesity at age 9–11: results of a multinational study, *Diabetologia* (2016). [DOI: 10.1007/s00125-016-4062-9](https://doi.org/10.1007/s00125-016-4062-9)

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