

Pre-pregnancy body fat, in-pregnancy weight gain, gestational diabetes combine to increase risk of high birthweight

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A new study shows that a woman's pre-pregnancy body fat (adiposity), in-pregnancy weight gain, and presence of gestational diabetes mellitus (GDM) can all combine to steeply increase the risk of giving birth to large-for-gestational age (LGA) babies to different degrees in white non-Hispanic, black non-Hispanic, White Hispanic, and Asian women, with the highest combined risk being in White non-Hispanic women. The research is published in the journal *Diabetologia* (the journal of the European Association for the Study of Diabetes) and is led by Dr Katherine Bowers and Dr Cuilin Zhang at the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the National Institutes of Health (USA), and colleagues.

The race-specific joint effects of three major [risk factors](#) on risk of LGA births have previously not been comprehensively analysed. In this study, Bowers and colleagues analysed data from a major US study (the Consortium on Safe Labour study), comprising 105,985 pregnancies in the period 2002.

The researchers found that greater pre-pregnancy adiposity, pregnancy weight gain and GDM were all independently associated with increased risk of [giving birth](#) to an LGA infant across all races (except GDM among non-Hispanic whites), in both underweight and normal-weight women. Among non-Hispanic white (11-fold increased risk), non-Hispanic black (7-times) and [Hispanic women](#) (10 times), the three-

factor joint effect was associated with substantially increased odds of LGA babies. However, for Asian women the joint effect of all three factors (five times increased risk) was approximately the same as any combination of two factors; whereas for Hispanic and non-Hispanic [white women](#), the association with LGA delivery more than doubled when comparing three risk factors with two.

Asian women had the highest proportion of LGA births (12.0%) compared with black (10.6%), Hispanic 10.6%) and white non-Hispanic (9.7%) women. Asian women were also the most likely to have GDM (9.0%), compared with Hispanic women (6.0%) and white non-Hispanic and black non-Hispanic women (both 3.4%).

The authors say: "Variations in the influence of GDM and weight characteristics on LGA by race may be due to differences in metabolism exemplified by variation in body composition and/or genetics."

They further point out that regional fat distribution can vary between women across these races, and the study shows that baseline (pre-pregnancy) levels of overweight and obesity also varied widely depending on race. Black women had the highest levels (28% obese, 26% overweight), then Hispanic (18% obese, 27% overweight), then White non-Hispanic (15% obese, 20% overweight), and lastly Asian (9% obese, 14% overweight).

The authors conclude: "In this large multi-race/ethnicity cohort in the USA, we observed that GDM was significantly associated with risk of women giving birth to macrosomic and LGA infants, even among normal-weight and underweight women. More importantly, this association was significantly modified by prepregnancy BMI, pregnancy weight gain and race. The joint effects of pre-pregnancy obesity, weight gain during pregnancy and GDM on fetal growth also varied by race/ethnicity. These results suggest that a woman's race may be an

important consideration when developing prevention strategies for excess fetal growth in women with GDM."

They add that it is important that the findings are replicated in future controlled studies before any concrete recommendations are issued. They say: "Given replicated evidence, especially white, but also black and Hispanic women would benefit greatly by focusing on a single factor, given the challenge of addressing pre-pregnancy weight and then weight gain and GDM together in pregnancy. Asian [women](#) would benefit most by addressing their GDM in addition to [weight gain](#) in pregnancy or entering pregnancy at a lower BMI."

Provided by Diabetologia

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