

Gestational weight gain in normal weight women is associated with offspring cardio-metabolic risk factors at 20 years of age

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ABSTRACT

Background: Limited knowledge exists on the long-term implications of maternal gestational weight gain (GWG) on offspring health, particularly among women of normal pre-pregnancy weight (body mass index (BMI): 18.5-24.9 kg/m²).

Objective: To examine whether high GWG in normal weight women is associated with adult offspring cardio-metabolic risk factors.

Design: We used a cohort of 308 Danish women who gave birth in 1988-89 and whose offspring participated in a clinical examination at 20 years of age. Main outcome measures were offspring BMI, waist circumference, weight-regulating hormones, blood lipids, and glucose metabolism. Associations were assessed using multivariate linear and logistic regression models.

Results: A weak positive association was observed between GWG during the first 30 weeks and offspring anthropometry. Each 1-kg increase in maternal GWG was associated with 0.1-kg/m² increase (95%CI: 0.01, 0.2) in offspring BMI and 10% (95%CI: 0.1%, 20%) increased odds of offspring overweight at the age of 20 years, with similar associations observed in both sexes. However, sex differences were observed for the association between maternal GWG and specific cardio-metabolic risk factors. Hence, per 1-kg increase in GWG, HOMA-IR (the homeostatic model assessment) increased 3.4% (CI: 0.8, 6.0%), insulin increased 3.7% (95%CI: 1.4%, 6.2%), and leptin increased 10.7% (95%CI: 5.7%, 15.9%) in male offspring. These associations were not observed in females, which may partly be explained by more frequent reports of dieting and physical exercise at follow-up among female offspring.

Conclusion: In normal-weight women, high GWG may have modest long-term implications on offspring cardio-metabolic risk factors at adult age.