

Maternal vitamin D status in pregnancy is associated with adiposity in the offspring: findings from the Southampton Women's Survey

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Abstract

Background: Low vitamin D status has been linked to adiposity, but little is known of the effects of low status in pregnancy on offspring body composition.

Objective: The objective was to determine how maternal vitamin D status relates to lean and fat mass of the offspring.

Design: The offspring of 977 pregnant women, who had serum 25-hydroxyvitamin D [25(OH)D] measured at 34 wk gestation, were followed up within 3 wk of birth and at 4 and 6 y of age for dual-energy X-ray absorptiometry assessment of lean and fat mass.

Results: The median maternal serum 25(OH)D concentration was 62 nmol/L (IQR: 43–89 nmol/L); 35% of the women studied had values <50 nmol/L. Lower vitamin D status was associated with lower fat mass in the offspring at birth but with greater fat mass at ages 4 and 6 y. It was not associated with lean mass at any of the ages studied. The opposing associations seen between maternal 25(OH)D (SDs) and fat mass (SDs) in the offspring at birth and at age 6 y were robust to adjustment for a range of confounding factors, including maternal BMI and weight gain in pregnancy [β (95% CI): 0.08 (0.02, 0.15) and -0.10 (-0.17 , -0.02), respectively]. The key independent predictors of higher maternal vitamin D status were season of assessment and use of vitamin D supplements.

Conclusions: Lower maternal vitamin D status may be linked to programmed differences in offspring fat mass. The findings require replication but add to a growing evidence base for a role of vitamin D in the origins of adiposity.

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