

OBESITY

Maternal weight linked to congenital anomalies in offspring

Two independent studies from the US and the UK have established an association between maternal weight and congenital anomalies in their offspring.

James L. Mills (National Institute of Child Health and Development, Bethesda, MD, USA) and colleagues chose a population-based, nested case-control study design to assess all live births in the state of New York that occurred between January 1993 and December 2003. A total of 17,250 children with congenital heart defects were identified and matched to 69,000 random controls without

congenital heart defects. After exclusion of cases with nonstructural and minor defects, 7,392 infants with congenital heart anomalies and 56,304 controls were analyzed.

“The most exciting finding is that in the group of women with obesity (BMI ≥ 30 kg/m²), the risk of having a child with congenital heart defects rose dramatically with increasing BMI,” recapitulates Mills, who adds, “the more obese the woman, the greater the risk”. The data also suggest that any improvement in BMI, even if an individual remains in the obese BMI range, could reduce this risk. Women with overweight (BMI 25.0–29.9 kg/m²), however, showed no increased risk of congenital defects in their offspring.

As expected, obesity increased the risk of some congenital heart defects, such as all anomalies of left and right ventricular outflow tract obstruction, atrial septal defects and aortic stenosis, but not others, for example, coarctation of the aorta. These findings indicate that obesity may cause congenital heart defects by disrupting more than one mechanism. “We suggest that obesity and diabetes are similar in this regard,” comments Mills.

The US findings are supported by a prospective cohort study on all singleton pregnancies between January 2003 and December 2005 at five maternity units in the north of England. Rankin *et al.* analyzed 41,013 pregnancies, of which 682 were

affected by structural congenital anomalies, including cardiovascular defects.

In agreement with Mills *et al.*'s findings, this analysis showed a significant increase in congenital anomalies in offspring of women with obesity and no effects in infants of mothers who were overweight. The UK investigators, however, also determined an increased overall risk of congenital anomaly, including atrial septal defects, in offspring of mothers with underweight (BMI ≤ 18.5 kg/m²), compared with mothers of recommended BMI. Underweight women were not at increased risk in the US study.

Both the US and the UK study excluded cases with a known teratogen or chromosomal anomaly, to rule out congenital anomalies of obesity-unrelated etiology.

Concluding, Mills suggests “that a woman may be able to reduce her risk of having a child with congenital heart defects by reducing her weight before she conceives,” but adds that “formation of the heart is an early event in pregnancy, so weight reduction during pregnancy could be too late to reduce this risk.” Findings by Rankin and colleagues indicate that this suggestion may require expansion to include women with underweight, who should also attain a BMI in the recommended range before conception.

Linda Koch

Original articles Rankin, J. *et al.* Maternal body mass index and congenital anomaly risk: a cohort study. *Int. J. Obes. (Lond.)* doi:10.1038/ijo.2010.66 | Mills, J. L. *et al.* Maternal obesity and congenital heart defects: a population-based study. *Am. J. Clin. Nutr.* **91**, 1543–1549 (2010)



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