TEXAS Health and Human Services | Texas Department of State Health Services

Body Mass Index (BMI) and Birth Defects: Texas, 2005–2008

Marengo L, Farag NH, Canfield M. Body mass index and birth defects: Texas, 2005–2008. Maternal and Child Health Journal. 2013; 17(10):1898-1907.

Texas ranks 12th nationally in the proportion of adult residents who are obese; approximately two-thirds of adult Texans are overweight or obese. Studies indicate that obesity is related to an increased risk for a number of birth defects; however, small sample sizes have limited the scope of birth defects investigated. We evaluated the association between maternal body mass index (BMI), three levels of obesity, and birth defects in a population-based registry covering ~1.6 million births.

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In this study, birth defect cases from the Texas Birth Defects Registry were linked to 2005–2008 vital records. Maternal BMI was calculated by using self-reported pre-pregnancy weight and height on the birth record and categorized as follows: underweight (BMI <18.5), normal weight (18.5–24.9), overweight (25.0–29.9), class I obese (30.0–34.9), class II obese (35.0–39.9) and class III obese (BMI ≥40.0). Prevalence ratios for specific birth defects for maternal BMI categories were estimated by using normal weight as the referent, adjusted for maternal age and race/ethnicity, and stratified by maternal diabetes status.

Main findings from this research

- Among mothers without diabetes, Class II and Class III obesity were associated with an increased risk for having offspring with any birth defect.
- Risk for the following birth defects was substantially increased among non-diabetic, obese mothers (BMI ≥30):
  - spina bifida
  - tetralogy of Fallot
  - cleft lip with or without cleft palate
  - hypospadias
  - epispadias
- Risk for the following birth defects increased with increasing BMI:
  - atrial septal defects
  - ventricular septal defects
  - pulmonary valve atresia/stenosis
  - patent ductus arteriosus
  - Clubfoot
- The presence of diabetes strengthened the association of BMI with these heart defects:
  - ventricular septal defects
  - pulmonary valve atresia/stenosis
  - patent ductus arteriosus
- In contrast to other defects, gastroschisis prevalence decreased with increasing BMI, with class I and class III obese mothers having a 65% decreased prevalence, compared to normal weight mothers.

Conclusion and discussion

Obesity is associated with an increased risk for adverse pregnancy outcomes, including several birth defects. Maternal diabetes further increased risk for several heart defects in obese mothers. Given the increased risk for birth defects associated with obesity and diabetes, preconception counseling should emphasize importance of maintaining normal weight and controlling diabetes.