Maternal prepregnancy body mass index and offspring attention-deficit/hyperactivity disorder: a quasi-experimental sibling-comparison, population-based design

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Abstract

Background
High maternal prepregnancy body mass index (BMI) has been associated with increased risk of offspring attention-deficit/hyperactivity disorder (ADHD). However, whether this effect is attributable to maternal or familial level confounds has been little examined.

Methods
The present study sought to examine these associations, utilizing data from the medical records of a health care system which treats 350,000 patients annually and a sibling-comparison design in a sample of 4,682 children born to 3,645 mothers.

Results
When examining the overall maternal effect, a linear association was observed between maternal prepregnancy BMI and child ADHD \[b = 0.04, 95\% \text{ confidence interval (95\% CI)} = 0.02–0.06, p = .0003\], such that a one-unit (i.e. 1 kg/m²) increase in prepregnancy BMI was associated with a 4% increase in the odds of ADHD (exp \(b = 1.04\)). However, when the model was reparameterized to take full advantage of the sibling design to allow for the examination of both maternal and child-specific effects, the child-specific prepregnancy BMI effect was not reliably different from zero \(b = -0.08, 95\% \text{ CI} = -0.23 \text{ to } 0.06, p = .24\). In contrast, at the maternal-level, average prepregnancy BMI was a reliably non-zero predictor of child ADHD \(b = 0.04, 95\% \text{ CI} = 0.02–0.06, p < .0001\) with each one-unit increase in maternal prepregnancy BMI associated with a 4.2% increase in the odds of ADHD (exp \(b = 1.04, 95\% \text{ CI} = 1.02–1.06\)).

Conclusions
The association between maternal prepregnancy BMI and offspring ADHD may be better accounted for by familial or maternal confounds rather than a direct causal effect of BMI.