Prenatal unhealthy diet, insulin-like growth factor 2 gene (IGF2) methylation, and attention deficit hyperactivity disorder symptoms in youth with early-onset conduct problems.

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Abstract

BACKGROUND:
Conduct problems (CP) and attention deficit hyperactivity disorder (ADHD) are often comorbid and have each been linked to 'unhealthy diet'. Early-life diet also associates with DNA methylation of the insulin-like growth factor 2 gene (IGF2), involved in fetal and neural development. We investigated the degree to which prenatal high-fat and -sugar diet might relate to ADHD symptoms via IGF2 DNA methylation for early-onset persistent (EOP) versus low CP youth.

METHODS:
Participants were 164 youth with EOP (n = 83) versus low (n = 81) CP drawn from the Avon Longitudinal Study of Parents and Children. We assessed if the interrelationships between high-fat and -sugar diet (prenatal, postnatal), IGF2 methylation (birth and age 7, collected from blood), and ADHD symptoms (age 7-13) differed for EOP versus low CP youth.

RESULTS:
Prenatal 'unhealthy diet' was positively associated with IGF2 methylation at birth for both the EOP and low CP youth. For EOP only: (a) higher IGF2 methylation predicted ADHD symptoms; and (b) prenatal 'unhealthy diet' was associated with higher ADHD symptoms indirectly via higher IGF2 methylation.

CONCLUSIONS:
Preventing 'unhealthy diet' in pregnancy might reduce the risk of ADHD symptoms in EOP youth via lower offspring IGF2 methylation.