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Poor prenatal nutrition may be linked to ADHD symptoms and conduct problems in children

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New research led by scientists from King's College London and the University of Bristol has found that a high-fat, high-sugar diet during pregnancy may be linked to symptoms of ADHD in children who show conduct problems early in life.

Published today in the *Journal of Child Psychology and Psychiatry*, this study is the first to indicate that epigenetic changes evident at birth may explain the link between unhealthy diet, conduct problems and ADHD.

Early onset conduct problems (e.g. lying, fighting) and attention-deficit/hyperactivity disorder (ADHD) are the leading causes of child mental health referral in the UK. These two disorders tend to occur in tandem (more than 40 per cent of children with a diagnosis of conduct disorder also have a diagnosis of ADHD) and can also be traced back to very similar prenatal experiences such as maternal distress or poor nutrition.

In this new study of participants from the Bristol-based 'Children of the 90s' cohort, 83 children with early-onset conduct problems were compared with 81 children who had low levels of conduct problems. The researchers assessed how the mothers' nutrition affected epigenetic changes (or DNA methylation) of IGF2, a gene involved in fetal development and the brain development of areas implicated in ADHD - the cerebellum and hippocampus. Notably, DNA methylation of IGF2 had previously been found in children of mothers who were exposed to famine in the Netherlands during World War II.

The researchers from King's and Bristol found that poor prenatal nutrition, comprising high fat and sugar diets of processed food and confectionary, was associated with higher IGF2 methylation in children with early onset conduct problems and those with low conduct problems.

Higher IGF2 methylation was also associated with higher ADHD symptoms between the ages of 7 and 13, but only for children who showed an early onset of conduct problems.

Dr Edward Barker from King's College London said: 'Our finding that poor prenatal nutrition was associated with higher IGF2 methylation highlights the critical importance of a healthy diet during pregnancy.'

'These results suggest that promoting a healthy prenatal diet may ultimately lower ADHD symptoms and conduct problems in children. This is encouraging given that nutritional and epigenetic risk factors can be altered.'

Dr Barker added: 'We now need to examine more specific types of nutrition. For example, the types of fats such as omega 3 fatty acids, from fish, walnuts and chicken are extremely important for neural development.'

'We already know that nutritional supplements for children can lead to lower ADHD and conduct problems, so it will be important for future research to examine the role of epigenetic changes in this process.'

Source:

King's College London
