

Fetal alcohol spectrum disorder linked to high prevalence of epilepsy

April 5 2010

Fetal alcohol spectrum disorder (FASD) refers to a range of negative developmental outcomes that result from maternal drinking during pregnancy. Children with FASD can suffer from many problems, including epilepsy, a disorder characterized by spontaneous recurrence of unprovoked seizures that affects 0.6 percent of the general population. A new study has found a much higher prevalence of epilepsy or history of seizures in individuals with FASD.

Results will be published in the June 2010 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"There are very few studies that have examined the relationship between seizures and epilepsy among individuals with FASD," noted James Reynolds, a senior scientist with the department of pharmacology and toxicology and the Centre for Neuroscience Studies, at Queens University. Reynolds is one of the study's authors.

"Many patients with epilepsy have a history of exposure to a prenatal insult, so we reasoned that prenatal exposure to [alcohol](#) could be such an epileptogenic insult," added Peter Carlen, a neurologist and senior scientist for the division of fundamental neurobiology at the Toronto Western Hospital, another of the study's authors. "Secondly, there is a significant overlap in brain structures that suffer from deficits as a result of chronic prenatal alcohol exposure and those that are associated with seizures, specifically in the brain's hippocampus. Thirdly, previous studies had failed to examine other complications that occur in mothers

who drink alcohol during [pregnancy](#), such as the effects of drinking on seizure activity. Finally, previous studies used small sample sizes and failed to clearly define seizures and FASD."

"Recently, scientists have begun investigating whether fetal alcohol exposure increases the risk for developing other behavioral health and neurological problems," added Dan Savage, Regents' Professor and chair of neurosciences at the University of New Mexico. "Indeed, evidence has begun to suggest that children with FASD are at greater risk for alcoholism, substance abuse or depression later in life. While it is too soon in the relatively young history of this research field to assess whether maternal drinking during pregnancy increases the risk of aging-related neurologic disorders, such as stroke or Parkinson's disease, several recent large-scale retrospective studies have examined whether fetal alcohol exposure increases the risk of developing epilepsy."

For this study, researchers examined the histories of 425 individuals (254 males, 171 females), between the ages of two and 49 years, from two FASD clinics. Relationships between a confirmed FASD diagnosis and other risk factors - such as exposure to alcohol or other drugs, type of birth, and trauma - were examined for the co-occurrence of epilepsy or a history of seizures.

"This study revealed a much higher prevalence of epilepsy and seizure history in individuals with a diagnosis of FASD," said Stephanie H. Bell, a researcher with the Centre for Neuroscience Studies at Queens University and corresponding author for the study. "In the general population, less than one percent are expected to develop epilepsy; of those with FASD, six percent had epilepsy and 12 percent had one or more seizures in their life. Subjects were more likely to have epilepsy, or a history of seizures, if exposure to alcohol had occurred in the first trimester or throughout the entire pregnancy."

"While this report supports a growing impression that fetal alcohol exposure may predispose the immature brain to the development of epilepsy, the results do not establish a direct cause-effect relationship between FASD and epilepsy," cautioned Savage. "Establishing a direct link between these clinical conditions will be a difficult challenge given our incomplete understanding of how ethanol damages the developing brain and what neuropathological changes in brain tissue lead to the development of different types of epilepsy."

Nonetheless, Savage added that it is clear that alcohol can damage the fetal brain. "The extent to which this damage leads to adverse neurobehavioral consequences likely depends upon a multitude of factors, including the amount and patterns of drinking during pregnancy, the presence of other pregnancy risk factors, such as cigarette smoking, substance abuse, or poor prenatal care, and the presence of other diseases affecting a mother's health, such as diabetes or high blood pressure," he said. "As risk factors accumulate, the risk of adverse neurodevelopmental outcomes also increases."

"Epilepsy and/or seizures in children are often missed in clinical assessments," noted Carlen, "and if it is untreated it can lead to increased or unrecognized cognitive problems. In the long-term, it can also result in problems in attention and memory and the risk of unattended and dangerous seizures. Many children may not have a predisposition to [epilepsy](#) and do not have the physical signs of FASD, but the physician should be aware of [alcohol exposure](#) during pregnancy when considering their patient's health and the etiology of particular diagnoses."

"This report builds on a growing body of evidence that maternal drinking during pregnancy may put a child at greater risk for an even wider variety of neurologic and behavioral health problems than we had appreciated before," said Savage. "The consensus recommendation of scientists and clinical investigators, along with public health officials

around the world, is very clear - a woman should abstain from drinking during pregnancy as part of an overall program of good prenatal care that includes good nutrition, adequate exercise, sufficient rest, and proper prenatal health care."

Provided by Alcoholism: Clinical & Experimental Research

Citation: Fetal alcohol spectrum disorder linked to high prevalence of epilepsy (2010, April 5)
retrieved 3 May 2024 from

<https://medicalxpress.com/news/2010-04-fetal-alcohol-spectrum-disorder-linked.html>

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