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Gene Disorder Linked to ADHD

Finding bolsters idea that condition has biological basis

By Steven Reinberg
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WEDNESDAY, Sept. 29 (HealthDay News) -- Many who suffer from attention-deficit hyperactivity disorder (ADHD) appear to have a genetic abnormality that may predispose them to the condition, British researchers report.

Their finding bolsters the belief that ADHD is not solely a social problem but can have origins in an individual's biology. ADHD affects 3 percent to 5 percent of children in the United States, according to the U.S. National Institute of Mental Health.

"ADHD is a complex disorder, and we have known for quite some time that it has a strong genetic composition," said lead researcher Nigel Williams, a senior lecturer in the department of psychological medicine and neurology at the Cardiff University School of Medicine in England.

"This is directly supported by our results, which provide direct evidence that ADHD is a neurodevelopmental disorder," he said.

The report is published online Sept. 30 in *The Lancet*.

For the study, Williams' team analyzed DNA from 366 children with ADHD, comparing it with the DNA from 1,047 children without the condition.

Children with ADHD were more likely to have missing or duplicated segments of DNA -- called copy number variations (CNVs) -- than were children without ADHD, the researchers found. This type of genetic variation is more common in those with brain disorders, they noted.

In addition, they reported finding significant overlap between these CNVs and CNVs associated with autism and schizophrenia. Though they are separate conditions, there's some overlap between ADHD and autism in terms of symptoms and learning problems, so the two conditions might share a biological basis, the researchers suggested.

The most striking overlap, they said, was found on a region of chromosome 16 that has been linked to schizophrenia and other major psychiatric disorders and includes a gene that plays a role in the development of the brain.

Children with ADHD tend to be restless, impulsive and easily distracted, often leading to serious problems at home and at school. Some have blamed the condition on such things as bad parenting and high-sugar diets.

However, others have cited evidence that ADHD may be partly genetic. Children of someone with ADHD have

been shown to be more likely to have the condition. Other research has reported that, with identical twins, if one twin has ADHD, the other has a 75 percent chance of having the condition.

Though no cure exists for ADHD, symptoms usually can be managed with medications and behavioral interventions, according to Williams' team.

Michael L. Cuccaro, an associate professor in the department of human genetics at the Hussman Institute for Human Genomics at the University of Miami Miller School of Medicine, said he was not surprised by the finding. "We are moving in a direction where CNVs are playing a role in a number of different neurobehavioral conditions," Cuccaro said.

CNVs are important in disrupting pathways that could cause mental problems, he explained. "A CNV in the same location could give rise to any number of different conditions," he said.

Cuccaro said he doesn't think a given CNV is specific to ADHD but rather that the effects of a CNV are more likely to result in ADHD plus intellectual disability. "A lot of things can go wrong when you have a CNV," he said.

And, he said, knowing the genetic landscape that can predispose someone to ADHD or another developmental condition could eventually become useful in diagnosing the conditions.

Knowing the genetics involved in ADHD also might lead to new treatments, as well as making current treatments more effective, Cuccaro said.

More information

The U.S. National Institute of Mental Health has more on [ADHD](#).

SOURCES: Nigel Williams, Ph.D., senior lecturer, department of psychological medicine and neurology, Cardiff University School of Medicine, Cardiff, England; Michael L. Cuccaro, Ph.D., associate professor, department of human genetics, Hussman Institute for Human Genomics, University of Miami Miller School of Medicine, Miami; Sept. 30, 2010, The Lancet, online

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