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Genetic deletion discovered as risk factor for autism and schizophrenia

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Researchers have identified the deletion of a genomic region on chromosome 17 as a significant risk factor for autism spectrum disorders (ASD) and schizophrenia. A mutation of one of the genes in the deleted interval already is a known cause of renal cysts and diabetes syndrome (RCAD).

The research, by an international collaboration of scientists led by Emory University, will be published in the American Journal of Human Genetics. Lead author of the study is Daniel Moreno-De-Luca, MD, MSc, Emory postdoctoral fellow in the Department of Human Genetics. Senior authors at Emory include David H. Ledbetter, PhD and Christa L. Martin, PhD.

Scientists have known that autism and schizophrenia are strongly influenced by genetic mutations. Although they have shown that rare copy number variations – insertions or deletions of genomic material – play a common and overlapping role in the two disorders, they had not previously identified this specific copy number variation (CNV), which confers very high risk.

The research team performed cytogenetic array analysis in patients with neurodevelopmental disorders referred for clinical testing. They detected a recurrent deletion at 17q12 in 24 patients out of more than 23,000 patients with ASD, developmental delay, intellectual disability, or schizophrenia. This deletion was not present in any of 52,448 control individuals.

"We calculate a minimum odds ratio of 13.58 for this sample," says Ledbetter, "meaning that someone with this deletion is at least 13.58 times more likely to develop ASD or schizophrenia than is someone lacking this CNV."

The deleted 17q12 region contains 15 genes, including HNF1B, the gene associated with RCAD. A number of the ASD patients in the study were found to have kidney disease and/or diabetes as well. RCAD patients, as opposed to what was initially believed, also often have neurodevelopmental disorders.

"We have uncovered a copy number variation that confers a very high risk for ASD, schizophrenia, and neurodevelopmental disorders," says Moreno-De-Luca. "This is significant, because the 17q12 deletion is among the 10 most frequent pathogenic recurrent genomic deletions identified in children with unexplained neurodevelopment impairments. We believe it also may increase risk for other psychiatric conditions such as bipolar disorder."

Provided by Emory University