Psychotic experiences in children predict genetic risk for mental disorders

October 20 2021, by Brittney Wheeler

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So much has happened in the world to cause people to think deeper about their mental well-being and resiliency during difficult times.

More than 50% of the population has struggled with a mental health issue at some point in their lives. They can be as disabling as physical conditions and are among the leading causes of disability and mortality in the world. However, we know remarkably little about what causes them, and it is important to identify early signs of mental disorders and respond with preventative measures.

Many have thoughts about how to approach mental health issues, but what if there was a way to catch signs of mental illness early in life?

New research from the lab of Deanna Barch, professor and chair of psychological and brain sciences in Arts & Sciences and the Gregory B. Couch Professor of Psychiatry and of radiology at the School of Medicine at Washington University in St. Louis, shows that genetic risk for mental disorders is associated with brain structure and the occurrence of psychotic-like experiences in 9- and 10-year-old children.

"We are still working on understanding the trajectories of psychotic-like experiences in childhood," said Nicole Karcher, lead author of the study, an instructor in psychiatry at the School of Medicine and a postdoctoral researcher in Barch's lab.

"Although the current research does not address this, only a subset of individuals with even severe psychotic-like experiences will likely develop a psychotic disorder in adulthood," Karcher said. "This study is part of a program of research trying to understand the most important predictors of psychotic-like experiences."

It is important to define what qualifies as a psychotic-like experience, Karcher said. According to the study, a psychotic-like experience (PLE) is a "nonclinical schizophrenia-spectrum symptom that includes perceptual abnormalities and mild delusional thoughts." The study recently was published in *Biological Psychiatry: Cognitive Neuroscience*

and Neuroimaging.

The research specifically looked at the association between PLEs in childhood and psychopathology-related polygenic scores (PGSs), which Karcher defined as "an estimated genetic liability for a given trait or outcome." The study also pulled in other information, including brain structure based on MRI metrics and cognitive functioning.

To explore this relationship, Karcher and her co-authors used baseline data from the Adolescent Brain Cognitive Development Study, a National Institutes of Health (NIH)-funded long-term study of brain development and child health in the United States. The researchers used the study to retrieve a sample of children with European ancestry, and they also examined a sample of children with African ancestries in follow-up analyses.

After caregivers provided consent, the children participating in the study completed a 21-item questionnaire that focused on the occurrence of PLEs during that month. Research assistants read the questions to the participants. The total score was used to determine the level of PLEs for each participant.

The results showed 44.6% of participants with no psychotic-like experiences to report. After analyzing the data, researchers found that while psychotic-like experiences in childhood are not necessarily out of the ordinary, it may be cause for concern in some children.

To dig a bit deeper, the researchers separated participants into three groups based on their PLE values. The first group included those reporting no PLEs, the second group included those reporting one or more PLEs with no substantial distress and the third group included those reporting one or more PLEs with substantial distress.

"Although a number of children are likely experiencing transient phenomena, the current research indicates that only a subset of children experiencing more severe phenomena show associations with polygenic liability for psychosis," Karcher said. "This points to the potential clinical relevance of early severe psychotic-like experiences, including increased genetic liability for psychosis."

The researchers found that polygenic scores for educational attainment were robustly related to childhood psychotic experiences.

"There was evidence that these associations may be partially explained by cognitive performance and brain volume," Karcher said.

In this study, a large portion of participants were of European ancestry. Additional research may allow for studying the implications of psychotic-like experiences in children of other populations. As important as this research is, it only begins to tap into how childhood psychotic experiences set the tone for future psychotic symptoms.

"Future research should begin to examine whether severe PLEs in childhood can be utilized as markers for further assessment and even potential intervention," Karcher said. "Overall, the findings help to further elucidate potential genetic markers for the development of early psychotic-like experiences."

More information: Nicole R. Karcher et al, Psychotic-like Experiences and Polygenic Liability in the Adolescent Brain Cognitive Development Study, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2021). DOI: 10.1016/j.bpsc.2021.06.012

Provided by Washington University in St. Louis