Medical Xpress

ADHD may increase risk of Parkinson's disease and similar disorders

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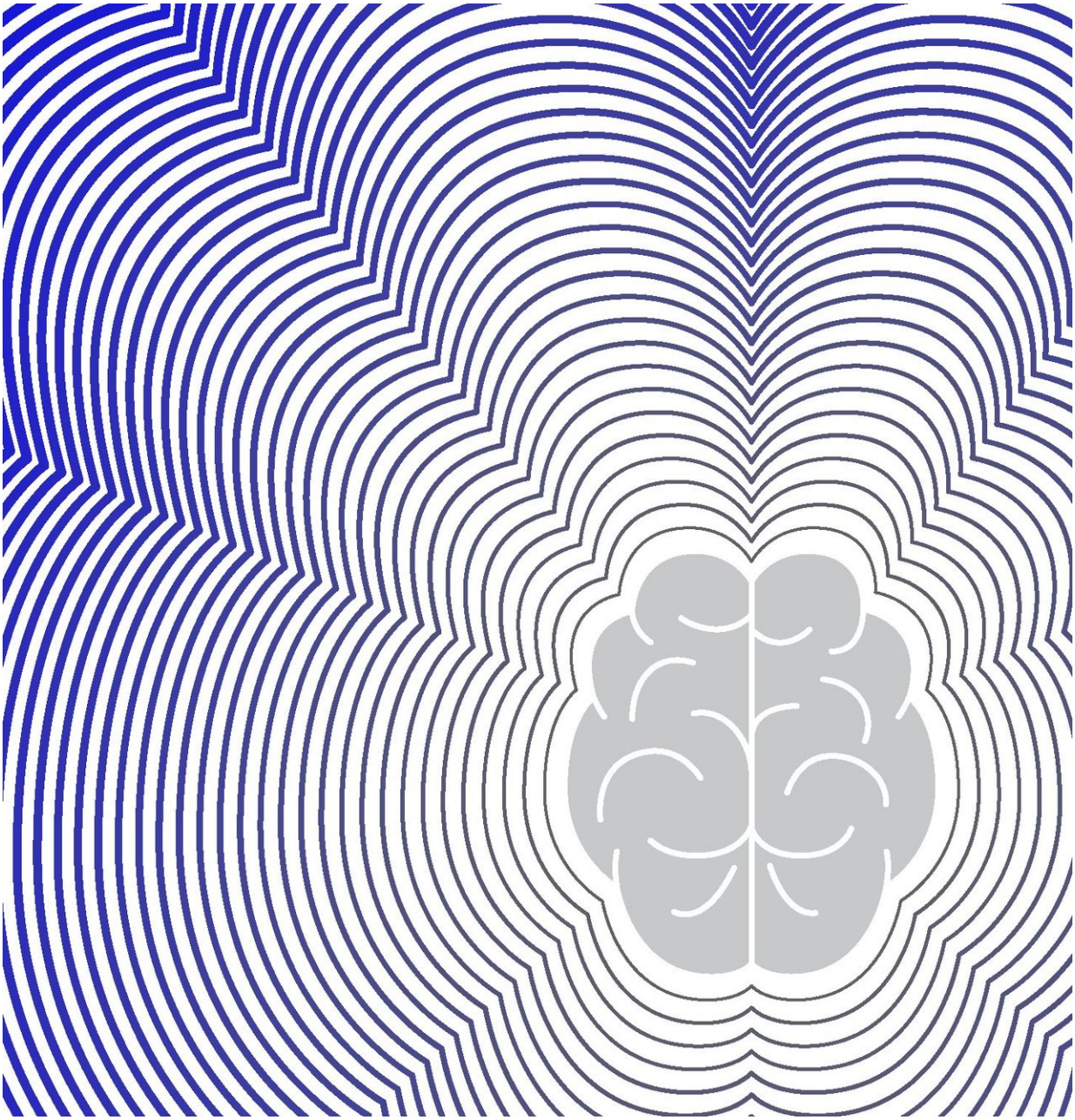

Could ADHD be a key to identifying future risk of Parkinson's and Parkinson-like diseases? Credit: University of Utah Health

While about 11 percent of children (4-17 years old) nationwide have been diagnosed with attention-deficit hyperactivity disorder (ADHD), the long-term health effects of having ADHD and of common ADHD medications remains understudied. Researchers at University of Utah Health found that ADHD patients had an increased risk of developing Parkinson's and Parkinson-like diseases than individuals with no ADHD history. The results are available online on September 12 in the journal *Neuropsychopharmacology*.

"Parkinson's disease is commonly thought of as a neurodegenerative disease associated with aging," said Glen Hanson, D.D.S., Ph.D., professor of Pharmacology and Toxicology and School of Dentistry at U of U Health and senior author on the paper. "This may be the first time where a childhood disease and its treatment may be linked to a geriatric expression of neurodegenerative disorder."

In a retrospective, population-based study, Hanson's team found ADHD patients were more than twice as likely to develop early onset (21-66 years old) Parkinson's and Parkinson-like diseases compared to non-ADHD individuals of the same gender and age. The estimated risk was six to eight-times higher for ADHD patients prescribed the stimulant medications, including methylphenidate (Ritalin, Concerta, Daytrana, Metadate and Methylin), mixed amphetamine salts (Adderall) and dexmethylphenidate (Focalin).

"If we were to follow 100,000 adults over time, in one year we would expect 1 to 2 people will develop Parkinson's disease before age 50,"

said Karen Curtin, Ph.D., associate professor in Internal Medicine at U of U Health and first author on the study. "If we were to follow 100,000 adults prescribed treatment for ADHD over time, we estimate that over a year 8 to 9 patients will develop Parkinson's disease before age 50."

The authors caution that patients with a more severe type of ADHD may inherently be at an increased risk of motor neuron diseases like Parkinson's, and the results may or may not be a direct result of the stimulant medication. Future studies are needed to reach a more definitive conclusion.

"The jury is still out," Curtin said. "The increased risk we observed in people could be linked to having ADHD itself or perhaps a more severe form of ADHD, which may be more likely to be treated with medications."

ADHD is a brain disorder associated with changes in the release of dopamine, which regulates the emotional response. Parkinson's disease is a progressive nervous system disorder associated with tremors, stiffness and slowing of movement. Typically Parkinson's does not develop until age 60 or later.

The team used the Utah Population Database (UPDB), which contains vital and medical records of more than 11 million individuals who have lived in the state, to examine twenty years of historic records. Eligible patients were born between 1950?1992, were at least 20-years old by the end of 2011, were residents of Utah after January 1, 1996 and had no prior diagnosis of Parkinson's or Parkinson-like diseases.

Using the UPDB, Hanson and his team compiled an ADHD population, consisting of 31,769 patients, of which 4,960 were prescribed stimulant medications (2,716 received amphetamine salts, 1,941 received methylphenidate and 303 received both). The non-ADHD comparison

population consisted of 158,790 individuals who were matched to the ADHD group on gender and age (5 to 1).

In addition to accounting for differences in gender and age, the study controlled for the effects of psychotic disorders and tobacco use that could be associated with Parkinson's independent of ADHD. Patients with a history of drug or alcohol abuse were excluded from the study. The team were not able to account for other factors that could contribute to the development of Parkinson's disease, including head trauma, brain injuries and environmental toxins.

According to Hanson, the study results should be considered preliminary. This study may be limited by the misclassification of non-ADHD subjects, who were diagnosed with the disorder outside of Utah, missed or incorrect diagnosis of Parkinson-like disease symptoms and the lack of information on the duration of use and dosage of ADHD medication prescribed.

This project builds on past research that reported a link between amphetamine abuse and the onset of Parkinson's disease, confirmed by other research groups.

"I believe the treatment is still a benefit, especially for children who cannot control their ADHD symptoms," Hanson said. "Medication really should be considered on a case-by-case basis."

More information: "Increased Risk of Diseases of the Basal Ganglia and Cerebellum in Patients with a History of Attention-Deficit/Hyperactivity Disorder," September 12, 2018, *Neuropsychopharmacology*.