

Brain chemical has key role in ADHD: studies

Aug 7, 2007

Two studies published on Monday showed the importance of a brain chemical in attention deficit hyperactivity disorder, with researchers saying it might help explain why people with ADHD often are substance abusers.

Researchers at the U.S. National Institutes of Health focused on the role of dopamine, a chemical messenger in the brain involved in governing movement, emotional response and the ability to feel pleasure and pain.

A team led by Nora Volkow, M.D., director of the NIH's National Institute on Drug Abuse, documented decreased dopamine activity in the brains of a group of adults with ADHD. Volkow said the decreased dopamine activity related to systems involved with attention and cognition, but also with reward.

Researchers have known that people with ADHD are more likely than others to smoke cigarettes and abuse alcohol, marijuana, cocaine and other drugs. The decreased dopamine activity in the brains of people with ADHD pointed to an explanation, Volkow said.

"If you take a drug of abuse, whether it's alcohol, nicotine or cocaine or methamphetamine -- it doesn't matter -- what you're going to be doing is temporarily increasing the concentration of dopamine in the brain," Volkow said in a telephone interview.

"So a person then has a greater risk (of substance abuse) because it's not just that they are taking the drug because they want to get high, but by taking the drug, they may actually feel better and temporarily perform better."

ADHD is a condition that often becomes apparent in preschool and early school years. Children with ADHD have a tougher time controlling their behavior and paying attention.

The usual treatment for ADHD may include drugs like Ritalin, or methylphenidate, a stimulant intended to lower impulsiveness and hyperactivity and boost attention. Volkow said the study may explain how such stimulant drugs work in people with ADHD -- by amplifying dopamine in the brain.

The researchers compared brain scans on 19 adults with ADHD -- average age 32 -- who had never received medication for the condition to brain scans of 24 healthy adults of a similar age without ADHD.

A team of researchers led by Dr. Philip Shaw of the NIH's National Institute of Mental Health used MRI exams to look at the brain structure of 105 children with ADHD and 103 children without ADHD. The researchers also performed DNA testing.

They found that a version of a gene involved with dopamine appeared to be associated with ADHD and with thinner tissue in areas of the brain that control attention.

The studies were published in the *Archives of General Psychiatry*.