

Kids with ADHD might find answers as researchers see diversity in disorder, treatment

Published: Tuesday, May 22, 2012, 5:50 AM Updated: Tuesday, May 22, 2012, 5:59 AM
By Joe Rojas-Burke, The Oregonian

A preschool teacher first told Marne Maykowskyj Nordean that her son Henry might have a developmental disorder.

"He was disruptive," says the Portland mother of three. "Most kids would do what they were told. Henry just never saw anything that way. His thoughts move in a cyclone instead of in a line. Teachers found it so easy to blame him for everything."

It took years for a proper diagnosis: attention deficit hyperactivity disorder. There is no simple test to find out if a child has ADHD, and the symptoms can look quite different from case to case. Even with a quick diagnosis, treatment remains a challenge. There's no way to predict whether any of the available medications are likely to improve symptoms, or cause intolerable side effects.

Researchers have come to realize that ADHD may not be a single disorder. It's starting to look like a group of related disorders, each potentially arising from different environmental and genetic factors and perhaps requiring a different treatment approach.

Last year, the Nordeans joined a clinical trial at Oregon Health & Science University that is starting to unlock some of the secrets of the disorder. The latest findings suggest ADHD may have five or more distinct subtypes. Knowing these subtypes seems to make it easier to accurately diagnose children. Eventually, the work could point to more tailored treatments.

"We have treatments that work, in the sense that most children will see some benefit," says Joel T. Nigg, a professor of psychology at OHSU. "The big problem is, if you take the treatment away the problem returns. You have not cured it, you've just contained it."

Nigg and colleagues are studying genes and brain changes of hundreds of children diagnosed with ADHD that might correlate with symptoms. They are carefully tracking the children's development over several years with repeated tests of behavior and mental processing skills. They've amassed one of the world's largest compilations of data on kids with ADHD.

Experts have long divided cases into three types: those dominated by attention problems, those dominated by hyperactivity, and those with high levels of both. In recent years, however, it's become clear that these categories aren't stable; one child's dominant symptoms can shift over time. A four-year-old's overwhelming attention problems, for instance, might give way to more prominent hyperactivity by age 10.

The OHSU researchers developed a better way to zero-in on sub-types.

It involves a field of mathematics known as graph theory. It's easiest to picture as a way to group people in space based on how alike they are on a multitude of tests of thinking and behavior. The researchers focused on self-control, attention, speed of mental processing, working memory and several other attributes. They tested the method on 285 children with ADHD.

The kids sorted into six groups, each characterized by distinct strengths and weaknesses in attention, memory, self-control and other tested areas. No group was better or worse in IQ testing or overall severity of ADHD symptoms.

"These are different neuropsychological profiles," says Nigg. "They all have ADHD, but perhaps all for a different reason."

When the researchers tested typically developing children, they also found great variability, enough to classify four distinct neuropsychological profiles. By taking this normal variation into account, the researchers found they could diagnose ADHD more accurately using behavioral test results.

Dr. Margaret Danielle Weiss, clinical professor of psychiatry at the University of British Columbia, who is not involved in the research, says it demonstrates children with ADHD actually may have different types of impairment. But she says the study leaves important questions unanswered.

"Further research in this area will have to account for the fact that typically developing normal children also demonstrate well characterized differences in their skills," she says.

Damien Fair, lead study author and an assistant professor of behavioral neuroscience and psychiatry at OHSU, says ADHD may prove to have more than six subtypes. Other methods that integrate brain imaging and genetic testing might prove most effective at categorizing the disorder. The long-term goal, he says, is to find a way to individualize treatment.

"We probably need to target our treatment strategies based on fine-tuned personalized differences," he says, "rather than treating everybody as one homogeneous group."

Relying on trial-and-error, doctors prescribed a series of medications for Nordean's son Henry, now 9.

"It was a nightmare," Nordean says. "His heart was racing. He was hallucinating at one point. He was depressed and miserable. We tried four different medicines." She says a non-stimulant medication eventually proved to work best. An unusually supportive teacher this year has also made a difference.

"He's doing fantastic with a teacher who lets him blossom," Nordean says.