

ADHD kids' brains mature more slowly

Delayed development in regions that focus attention, study finds

The Associated Press

updated 5:00 p.m. ET, Mon., Nov. 12, 2007

WASHINGTON - Crucial parts of brains of children with attention deficit disorder develop more slowly than other youngsters' brains, a phenomenon that earlier brain-imaging research missed, a new study says.

Developing more slowly in ADHD youngsters — the lag can be as much as three years — are brain regions that suppress inappropriate actions and thoughts, focus attention, remember things from moment to moment, work for reward and control movement. That was the finding of researchers, led by Dr. Philip Shaw of the National Institute of Mental Health, who reported the most detailed study yet on this problem in Monday's online edition of Proceedings of the National Academy of Sciences.

"Finding a normal pattern of cortex maturation, albeit delayed, in children with ADHD should be reassuring to families and could help to explain why many youth eventually seem to grow out of the disorder," Shaw said in a statement.

But not all children do outgrow the disorder, and co-author Dr. Judith Rapoport, also of the NIMH Child Psychiatry Branch, said the researchers are working to determine the differences between those that have a good outcome and those who do not.

Between 3 percent and 5 percent of school-age children are thought to have attention deficit hyperactivity disorder.

Biologically driven

Dr. Louis J. Kraus, chief of child psychiatry at Rush University Medical Center in Chicago, said "what is really important about this study is it shows us there is clearly something biologically driven for children with ADHD."

Kraus, who was not part of the research team, said that with this finding no one can argue that children are making it up. "We don't know what the meaning is yet, whether it would change any type of treatment, but it is showing that there is something biologically different."

It is important that parents don't immediately jump out and want to get some type of MRI of their child's brain, or functional study to support a diagnosis," Kraus added in a telephone interview.

Shaw agreed: "Brain imaging is still not ready for use as a diagnostic tool in ADHD. Although the delay in cortex development was marked, it could only be detected when a very large number of children with the disorder were included. It is not yet possible to detect such delay from the brain scans of just one individual. The diagnosis of ADHD remains clinical, based on taking a history from the child, the family and teachers."

The research team used scans to measure the cortex thickness at 40,000 points in the brains of 223 children with ADHD and 223 others who were developing in a typical way. The scans were repeated two, three or four times at three-year intervals.

In both groups the sensory processing and motor control areas at the back and top of the brain peaked in thickness earlier in childhood, while the frontal cortex areas responsible for higher-order executive control functions peaked later, during the teen years, they said.

Delayed in the ADHD children was development the higher-order functions and which coordinate those with the motor areas.

The only part of the brain that matured faster in the ADHD children was the motor cortex, a finding that the researchers said might account for the restlessness and fidgety symptoms common among those with the disorder.

Earlier brain imaging studies had not detected the developmental lag, the researchers said, because they focused on the size of the relatively large lobes of the brain.

The sharp differences were discovered only after a new image analysis technique allowed the researchers to pinpoint the thickening and thinning of thousands of cortex sites in hundreds of children and teens, with and without the disorder.

"If you're just looking at the lobes, you have only four measures instead of 40,000," explained Shaw. "You don't pick up the focal, regional changes where this delay is most marked."

Slowest to mature in ADHD children were parts of the front and side of the brain that integrate information from the sensory areas with the higher-order functions. One area lagged five years in those with the disorder.

Also participating in the study were researchers at the Montreal Neurological Institute, McGill University, Canada. The research was funded by the Intramural Research Program at NIH.

© 2007 The Associated Press. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

URL: <http://www.msnbc.msn.com/id/21757514/>

[MSN Privacy](#) . [Legal](#)

© 2007 MSNBC.com