

The Washington Post

Brain Scans Link ADHD to Biological Flaw Tied to Motivation

By Katherine Ellison
Special to The Washington Post
Tuesday, September 22, 2009

For decades, attention-deficit hyperactivity disorder has sparked debate. Is it a biological illness, the dangerous legacy of genes or environmental toxins, or a mere alibi for bratty kids, incompetent parents and a fraying social fabric?

With 4.5 million U.S. children having received a diagnosis of the disorder -- and more than half of them taking prescription drugs to control it -- the question has divided doctors and patients, parents and teachers, and mothers and fathers.

Scientists maintain that they've been narrowing in on the origins and mechanics of disabling distraction, while gathering increasing evidence that ADHD is as real as such less controversial disorders as Down syndrome and schizophrenia. Their most recent progress is described in a Sept. 9 report in the Journal of the American Medical Association, based on a new study that indicates a striking difference in the brain's motivational machinery in people with ADHD symptoms.

"This is another big piece in the puzzle saying that there is something there, that this is not simply a matter of anxious parents," said James Swanson, a co-author of the report and a developmental

psychologist based at the University of California at Irvine.

The JAMA study said that, compared with a group of healthy subjects, brain scans of 53 adults with ADHD revealed a flaw in the way they process dopamine, which among other things, alerts people to new information and helps them anticipate pleasure and rewards. Swanson speculated that people with ADHD may even have a net deficit of dopamine.

The findings offer support for a long-held theory about why people with ADHD tend to be so easily distracted and bored -- so hard to teach in school, so prone to end up in high-stimulus jobs such as in sales or the media, and so susceptible to gambling and drug abuse. According to the theory, the trouble is a lack of motivation as well as a deficit of attention: People with the disorder

Advertisement



http://www.washingtonpost.com/wp-dyn/content/article/2009/09/21/AR2009092103100_pf.html

Print Powered By  FormatDynamics™

The Washington Post

Brain Scans Link ADHD to Biological Flaw Tied to Motivation

can't generate the same degree of enthusiasm as other people for activities they don't automatically find appealing.

"Parents always wonder why their children with ADHD can skateboard for hours and practice the same thing over and over but can't stay on task in school," said Swanson, who said he and fellow researchers have taken to calling the syndrome "an interest deficit."

The project was led by Nora Volkow, a research psychiatrist who is director of the National Institute on Drug Abuse, together with scientists affiliated with institutions including the Brookhaven National Laboratory and the Mount Sinai Medical Center. It took eight years to complete, mostly owing to the difficulty of finding people with diagnosed ADHD who had never taken medication or recreational drugs, which might have subtly changed their brains, and had no history of other serious psychiatric illness. Children weren't involved because of regulations against subjecting minors to unnecessary radiation.

Volkow's team collected detailed images of participants' brains with positron emission tomography, or PET, scans after injecting them with a radioactive chemical that binds to dopamine receptors and transporters, which take up and recycle dopamine as it moves between neurons. The imaging showed that, in people with ADHD, the receptors and transporters are significantly

less abundant in mid-brain structures composing the so-called reward pathway, which is involved in associating stimuli with pleasurable expectations.

Stephen Hinshaw, chair of the psychology department at the University of California at Berkeley, praised the study as being "above and beyond the normal rank and file" of incremental progress in the quest to solidify the dynamics of ADHD. "It's a big deal to get this kind of nonmedicated sample," he added.

The mainstream scientific consensus is that, as with other mental illnesses, there's no blood test or brain scan that proves an individual has ADHD. The disorder instead is diagnosed via a checklist of troublesome behaviors, including impulsivity, daydreaming and forgetfulness. What makes the diagnosis particularly difficult, Hinshaw said, is that those behaviors all fall within the normal range of human behavior. People

Advertisement

30-Year Fixed Rate
\$200K loan for \$1,060/mo.

866-945-4410
or YourQuickRefinance.com

*Rates can change. Act now!

Quicken Loans

The Easiest Way to Get a Home Loan®

http://www.washingtonpost.com/wp-dyn/content/article/2009/09/21/AR2009092103100_pf.html

Print Powered By  FormatDynamics™

The Washington Post

Brain Scans Link ADHD to Biological Flaw Tied to Motivation

with ADHD are simply farther out on the spectrum, and, often, enough so as to wind up in constant trouble. In addition, symptoms typical of ADHD can also stem from other illnesses or injuries. Swanson said scientists are probably years away from a biological test for the disorder, though the new study is a step in that direction.

Researchers say they've been closing in on biological differences in people with ADHD, including genetic roots -- some scientists have found the disorder to be more hereditary than schizophrenia and only somewhat less so than height -- and even the relative size of certain brain structures in childhood.

Popular skepticism persists, with critics ranging from the extreme of Scientologists, who militantly oppose psychiatry in general, to more mainstream voices saying the disorder may exist but is over-diagnosed -- meaning that the powerful medications used to treat it are being, in essence, abused.

"My position is that this is a parenting issue," said John Rosemond, the psychologist who writes the nationally syndicated column "Traditional Parenting" and calls ADHD a "fiction." Rosemond said he hadn't yet read about the dopamine study, but, in a phrase frequently used by naysayers, maintained that the symptoms associated with ADHD "describe a typical toddler."

Volkow acknowledged that sometimes ADHD is applied to children who don't fit the medical criteria, including bright kids who misbehave when they get bored. But she added that the disorder is at least just as often under-diagnosed, in which case, she said, "the tremendous misinformation" promulgated by critics does harm to people who ought to be getting help. Longitudinal studies have shown that untreated children with ADHD are substantially more prone than those without it to a long list of dangerous outcomes, including drug and alcohol abuse, academic failure, car accidents and teen pregnancies.

The syndrome first appeared in the psychiatrists' atlas, the Diagnostic and Statistical Manual of Mental Disorders, in 1987, replacing "attention deficit disorder," which is still frequently used by authors and other commentators. In previous decades, the same group of symptoms had been referred to with names including

Advertisement

Get a Free GE Home Alarm System
Call Now: 866-943-3874
Protect America



http://www.washingtonpost.com/wp-dyn/content/article/2009/09/21/AR2009092103100_pf.html

Print Powered By  FormatDynamics™

The Washington Post

Brain Scans Link ADHD to Biological Flaw Tied to Motivation

"minimal brain dysfunction" and "hyperkinetic impulse disorder."

Progress in the search for biomedical markers for ADHD might seem to help justify medication, including pharmaceutical stimulants, now the most common U.S. intervention. Indeed, research has shown that stimulants help alleviate the classic ADHD symptoms in the majority of cases.

Volkow, nonetheless, said she believes in trying behavioral therapies first, using drugs only if those aren't effective. She said her team's findings underscored the value of having teachers be as engaging as possible and of having parents reinforce good behavior with skillful praise and rewards.

"Our brains are hard-wired to respond to bribes," she said.

And that goes even more so, apparently, for brains with ADHD.

Comments: health@washpost.com.

Advertisement



Send flowers
for any occasion

Bouquets \$19⁹⁹
from 19^{+s/h}

ProFlowers[®]
Order ONLY at
proflowers.com/happy
or call 1-877-888-0688

http://www.washingtonpost.com/wp-dyn/content/article/2009/09/21/AR2009092103100_pf.html

Print Powered By  FormatDynamics™