

Kids with ADHD may smoke to treat their attention problems

By Jim Dryden

May 13, 2003 -- Studying twins, investigators at Washington University School of Medicine in St. Louis have found that children with a particular type of attention deficit-hyperactivity disorder (ADHD) often don't get treatment and are at increased risk for cigarette smoking.

Children and adolescents with ADHD can be divided into two primary subgroups: those with only severe inattention and those with both inattention and hyperactivity. For the last several years, a team of psychiatry researchers has been studying Missouri families with twins, looking in detail at 800 families where at least one child had symptoms of ADHD.

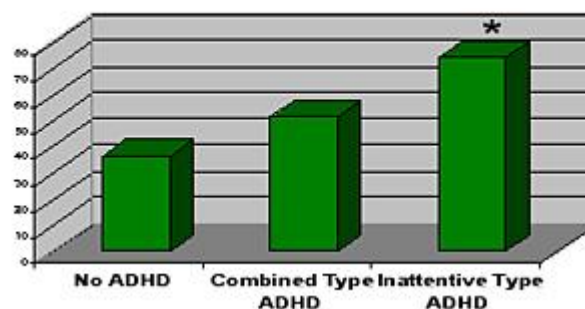
"All of the boys and girls in the study were adolescents," says Richard D. Todd, M.D., Ph.D., the Blanche F. Ittleson Professor and director of the Division of Child Psychiatry at Washington University. "We interviewed the twins themselves and their parents to try to learn as much as we could about their ADHD symptoms and about how the disorder tends to run in families."



Todd's team found that both of the major subtypes of ADHD often are inherited, but they also found that children with severe inattention problems were less likely to be referred to specialists and less likely to receive treatment than those whose ADHD also involved hyperactivity or impulsive behavior.

"More than 70 percent of those with the combined subtype of ADHD received some kind of treatment, and many of those children received medication," Todd says. "But only about 30 percent of kids with only severe inattention problems got any clinical attention, and even fewer received medication, in spite of the fact that most studies suggest that inattention problems respond to medicine well whether hyperactivity is present or not."

Association of ADHD Subtypes with Regular Smoking



Smoking is more common among kids with attention deficit-hyperactivity disorder (ADHD) than those without the disorder, but the risk for smoking rises dramatically in those with the inattentive subtype of ADHD.

Todd says what many untreated children do get is nicotine. His team has found that many more children and adolescents with the inattentive subtype of ADHD smoke than normal, when compared with those who have the combined subtype of ADHD that includes hyperactivity and impulsivity. Todd believes they may be using nicotine to help cope with their attention problems.

Much of the scientific literature examining the causes of ADHD points to the neurotransmitters dopamine and norepinephrine and to brain regions toward the front of the brain. Those same brain regions also contain significant numbers of nicotinic receptors, which, as the name suggests, are the receptors that nicotine binds to when a person smokes. The receptors have other jobs, too, but they are thought to be involved in nicotine's addictive properties and in the positive effects it provides.

In addition, some studies of adults using nicotine patches have found that patches can increase attention span, both in adults with normal attention and in those with ADHD. Stimulant medications used to treat ADHD, such as Ritalin® and Concerta®, also improve attention in children with or without ADHD, but they provide additional benefits in those who have the disorder.



Richard D. Todd, Ph.D., M.D.

"It appears one possible reason many of these children smoke is that they are treating their attention problems in a very specific, pharmacological way," Todd says.

He wouldn't recommend that kids get the patches because nicotine has too many other side effects. But he says it may be worthwhile to look at compounds related to nicotine because of genetic research that has further implicated nicotinic receptors in the brain.

Todd's team has studied a gene that makes a protein that helps nicotine bind to receptors when people smoke. The gene, called CHRNA4, also appears connected to the inattentive form of ADHD.

"We know there is a strong genetic predisposition to attention problems, and nicotine abuse also seems to be highly heritable," Todd says. "Recently, we have identified variations in the CHRNA4 gene that appear to be over-represented in children with the inattentive subtype of ADHD."

That finding provides a two-way association, he says. First, children with the inattentive form of ADHD have genetic variations involving CHRNA4. Todd's team also knows that children with the inattentive form of ADHD are at increased risk for smoking and nicotine use. Now, he is studying smokers who don't have ADHD to look for variations in that gene that might tie everything together.

But even if the CHRNA4 gene is related to both ADHD and smoking, Todd says it probably won't be the only one.

"It's likely that ADHD will be like high blood pressure or diabetes," he says. "Several genes will be involved — at least five and perhaps as many as 10 or 20. Some are going to be more prevalent in certain subtypes of ADHD, but I think we'll find a high number of candidate genes involved in these disorders."

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