

Revvng up the brain

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The controversial prescription drug Ritalin, best known as a treatment for children diagnosed with attention deficit disorder, has been co-opted by a new population: healthy people trying to boost their mental performance.

The phenomenon, which has been increasingly documented by university researchers during the last five years--and fueled by anecdotal evidence from pediatricians, guidance counselors and heads of test preparation programs--is more than a fad. In some circles, Ritalin is known as a "cognitive performance enhancer," or the academic equivalent to doping in sports.

College students, who once relied on caffeine, cigarettes and diet pills to get through exams, call Ritalin a "study aid" and use the stimulant to stay wired for all-nighters. Pressured high schoolers take Ritalin for sharper focus and concentration before major tests like the spring's college entrance exams.

Adults sample their child's medication to see whether popping an occasional pill might help meet work deadlines and improve productivity. Or, in bizarre cases, they steal it. Last month an elementary school custodian in Indiana admitted that she had swiped Ritalin from the school's nursing office, hoping it would improve her cleaning performance.

The potential promise and perils of so-called "smart pills" such as Ritalin and other advancements in the pipeline, including memory-enhancing drugs developed for Alzheimer's patients, have spawned a new area of concern, debate and inquiry called "neuroethics."

One view is that accelerated learning or memory improvements, designed for medical purposes but adopted by the public, could greatly benefit society. But in addition to safety issues, "moral questions of fairness and choice are raised when students use stimulants to do better academically," said pediatrician Lawrence Diller of the University of California at San Francisco, author of "Running on Ritalin" and "Should I Medicate My Child?"

"In sports we value not only the home-run record but the effort involved in reaching that goal. Taking a performance-enhancing pill cheapens that sense of effort," Diller said.

In addition, the fact that some athletes use drugs invariably pressures others to do the same to keep pace.

"Is it any different if scholars are popping pills instead of athletes?" Diller asked.

During the next decade, perfectly healthy individuals will increasingly use drugs that improve how the brain functions, according to experts in neuroscience, bioethics, health policy and education who met in New York City last year to discuss the social ramifications of cognitive enhancement. The results of the meeting--including guidelines on how to handle the complex issues related to revving up the brain--are expected to be published in a scientific journal in the next two months.

"Unprecedented moral issues surround the impact that neurotechnology may have on the very definition of human nature--on our capacity to reason efficiently and solve problems and to have emotions, self-concept and unique cognitive style," conference co-chair Judy Illes of Stanford wrote in a meeting overview. "How we envision this future must be the focus of continuing conversations." Ritalin, the brand name for methylphenidate, is the most popular example in the debate, because it already is widely available and shows signs of affecting those who have been diagnosed with attention deficit and those who are "normal."

Streamlining brain function

A stimulant, it works by increasing levels of dopamine in certain parts of the brain. Dopamine is a neurotransmitter that controls movement, attention and other functions, helping the brain work more efficiently, said Dr. Dana Brazdziunas, director of behavioral and developmental pediatrics at the Ronald McDonald Children's Hospital of Loyola University Medical Center. A stimulant like Ritalin can also affect some of the other neurotransmitters in the brain such as norepinephrine. Four to 6 percent of Americans have attention deficit disorder, according to the Attention Deficit Disorder Association. For some underperforming children, Ritalin and a similar drug called Adderall can increase attention span to help them reach a "normal" functioning level.

Some experts have said that if used properly, the effects can be as dramatic as finding the right pair of eyeglasses for nearsightedness. Ritalin, however, is considered a universal enhancer. If a child not struggling with ADD takes Ritalin in a pill form, he might feel he has an above-average attention span. "It's related to the pressure students feel to do well at classes," said Katie Finn, 20, a junior at the University of Iowa, who knew of peers in high school who would fake attention deficit for a prescription of Ritalin. "It's a study enhancer, and people take it with the goal of being more focused." Finn said she has been tempted to

try it herself, but so far she hasn't. "At times I feel distracted and would love to be focused, but my fear is the risk associated with it," she said.

Though relatively safe if taken as prescribed, Ritalin does not work for everyone and has high abuse potential. If it is snorted or injected rather than taken orally, it can produce a euphoric high. Adderall produces a more potent buzz, experts say. Side effects include an inflated sense of accomplishment, insomnia, loss of appetite, nausea, vomiting and headaches. Overdosing can cause tremors, hallucinations and seizures. Inappropriate doses actually can overstimulate the body, making concentration quite difficult and resulting in feelings of agitation, rather than focus and calm.

Experts disagree on the cognitive effects. Some say ingesting a high dose of Ritalin at 10 p.m. can keep a person awake all night, but there is no evidence Ritalin can help on tests. In fact, sleep deprivation that accompanies Ritalin abuse can make matters worse.

"It increases your vigilance when things are boring and hard, but it doesn't make you any smarter, more creative or more organized," said Mina Dulcan, head of child and adolescent psychiatry at Children's Memorial Hospital. "If you're an airport screener with thousands of bags and you have to watch closely to catch one thing, it might help. But for most people, attention isn't what limits your knowledge. It's creativity and organization."

Flunks as a test strategy

Dulcan said the stimulant is extraordinarily safe but a lousy test-taking strategy. "You don't know what dose is right. Too much might result in a headache or stomachache, make the student overfocused or too vigilant, so they can't shift attention," she said. "It's not a magic smartness pill."

In today's frenetic world, however, an increased attention span could be an advantage, even if it's only psychological. With increased pressure to achieve, students and parents have found Ritalin keeps them going a little more, said Paul McHugh, a professor of psychiatry at Johns Hopkins University.

"It probably doesn't raise their ultimate IQ, but it pushes them along a little faster," said McHugh, a member of the President's Council on Bioethics, which has debated the issue at length. "Since we're a time-determined society--you have to clear this hurdle at a certain age--it could allow kids to speed up learning on algebra, geometry and history, giving them a little advantage."

Safety and efficacy aside, cognitive enhancers are rife with other ethical issues. Most people consider it akin to corking a bat, including the U.S. Chess Federation, which agreed to begin drug testing for caffeine, amphetamines and Ritalin in 1991, saying the substances could provide an unfair advantage. In addition, using pills to treat or enhance natural conditions, such as attention span, shyness or memory, can shift the definition of "normal" and risk medicalizing regular human behavior, said Illes, a senior research scholar at the Stanford Center for Biomedical Ethics and Department of Radiology.

If only the wealthy have access, the effects have the potential to change the fabric of society, Illes said.

Of even greater concern to Illes are potential coercive uses, especially with a long history of steroid abuse in athletics.

"If we can improve cognition and control fluctuations of mood, should all school bus drivers be required to take the drug so attention and alertness is at a maximum?" she asked.

"We're talking about the brain, as opposed to eyeglasses or a prosthetic device for an amputated limb," she said. "We're talking about the definition of personhood and privacy at a different level than ever before."

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