

Recent Drug Use Masks Cocaine Abusers' Cognitive Impairment

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Patricia A. Woicik

(PhysOrg.com) -- Recent cocaine use may hide some of the cognitive deficits commonly experienced by individuals addicted to cocaine, scientists at the U.S. Department of Energy's Brookhaven National Laboratory report in a study published in the April 2009 issue of *Neuropsychopharmacology* — a special issue dedicated to cocaine research. The study was part of an effort to better understand individual differences among cocaine-addicted subjects to help clinicians develop more effective treatment plans.

“We were looking for individual differences among substance abusers that might impact each person’s ability to function so we can help individuals make the most of available treatments,” said Patricia A. Woicik, a post-doctoral fellow in Brookhaven’s Neuropsychomaging group and lead author on the paper. The scientists looked for differences in neuropsychological function in 64 cocaine-addicted individuals and 64 healthy control subjects matched by gender and race. They were specifically looking for differences between cocaine users who had recently used cocaine and those who had been abstinent for a longer period.

Scientists first administered drug-screening (urine) tests to identify subjects who had used cocaine within the last 72 hours. Following the screening test, all participants completed a battery of tests that measured attention and executive function (e.g., planning ability), memory and learning, and motor function.

“Compared with healthy subjects, cocaine abusers had deficits on tasks that tested attention, executive function, and verbal memory,” Woicik said — a finding consistent with her lab’s previous research. In the current study, however, the scientists extended their previous findings by examining the effects of recent cocaine use in a larger sample.

The main finding: “The deficits were most obvious in the cocaine-addicted individuals who had been abstinent from cocaine longer than 72 hours,” Woicik said, “and this effect was not due to withdrawal-related depressive symptoms.” Surprisingly, the subjects with the most cognitive impairment reported the least depression and vice versa.

The scientists also tested other factors that frequently differ between cocaine-addicted individuals and healthy populations — such as cigarette smoking and frequency of alcohol consumption — none of which changed the results.

The finding of less impairment in recent users of cocaine led Woicik to speculate that this better cognitive functioning as associated with recent cocaine use may potentially predispose cocaine-addicted individuals to relapse. “This notion is consistent with a self-medicating hypothesis of addiction, which suggests that addiction results from continual use of a specific drug for its remedial effects,” she said. “In other words, an individual can become addicted to a specific drug because its unique psychopharmacologic action reduces emotional (e.g., negative mood) or cognitive (e.g., poor attention) deficits with which the individual struggles.”

The research also suggests that pharmaceutical agents that improve neurocognitive function without negatively influencing mood might increase positive outcomes of addiction treatment. “A non-addictive drug that enhances neurocognitive function (similar to cocaine in the recent users) might be an effective therapy for cocaine addiction, particularly in reducing relapse,” Woicik said.

Woicik added that the findings also suggest a new way to make use of drug-screening findings. “Drug screening tests are becoming a ubiquitous feature of court-mandated and voluntary treatment programs,” she said. “If urine drug tests are indicators of the extent of cognitive and emotional impairments in drug abusers, then this common, inexpensive test might be used to customize interventions, particularly at the time of entry into a treatment program.” Future research is required to establish whether urine screening is a valid and reliable marker for the severity of these impairments, she emphasized, “however the current findings point to this possibility.” Collaborators on the study were Rita Z. Goldstein (who led the study as principal investigator), Nelly Alia-Klein, Gene-Jack Wang, Thomas Maloney, Tanya Lukasik, and Olga Yeliosof, all of Brookhaven Lab; Scott J. Moeller, University of Michigan; and Nora D. Volkow, National Institute on Drug Abuse (NIDA).

Provided by Brookhaven National Laboratory

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