



Short-term Ecstasy use may lead to long-term grief

Even brief experimentation with the "club drug" Ecstasy (MDMA) could put adolescents and young adults at risk for lifetime depression, according to a recent study.

Lynn Taurah and Chris Chandler studied 519 subjects including current and past Ecstasy users, people who used other drugs such as cocaine and amphetamines but not Ecstasy, and people who did not use illicit drugs. The researchers asked participants to fill out a questionnaire measuring depressive symptoms, with a score of 25 or more indicating clinical depression. Subjects were divided into three categories: frequent Ecstasy users (more than 20 times), infrequent users (one to 19 times), and nonusers.

The researchers found that people who did not use Ecstasy, including subjects who took other drugs, had average depression scores of about four points. In contrast, Ecstasy users—including those who had used the drug only one or two times—had scores as high as 16 or 17, and chronic users had scores as high as 28.

Taurah says, "People often think taking Ecstasy just once or twice won't matter, but what we're seeing is evidence that if you take Ecstasy a couple of times you do damage to your brain that later in life will make you more vulnerable." She adds, "[W]e've got a group taking every other kind of drug, including amphetamines, ketamine and cocaine, and they haven't got these depression scores." This, she says, argues against the idea that the depressive symptoms of Ecstasy users predated drug use.

The researchers' findings support those of laboratory scientists who are reporting that Ecstasy damages neurons which produce the neurotransmitter serotonin. Serotonin abnormalities are linked to depression as well as to other psychiatric problems including impulsive aggression and suicide attempts. In addition, the drug appears to damage neurons involved in the production of the neurotransmitter dopamine. Among recent findings:

- Researcher Andy Parrott reports that a review of the literature on Ecstasy shows that "repeated doses of MDMA cause serotonergic neurotoxicity in laboratory animals, and there is extensive evidence for long-term neuropsychopharmacological damage in humans." He notes that even after stopping their use of the drug, regular Ecstasy users "often display reduced levels of 5-HT, 5-HIAA, tryptophan hydroxylase and serotonin transporter density," all evidence of impaired serotonin system function. In addition, he says, studies of Ecstasy users show deficits in learning and memory, higher cognitive processing, sleep, appetite, psychiatric well-being, and sexual desire.
- Using PET scans, R. Buchert and colleagues in Germany found that compared with non-drug users, Ecstasy users showed significant alterations in serotonin transporter distribution in several brain regions. Tests of past drug users indicated that these changes may be reversible to some degree.
- Johns Hopkins researchers reported that primates exposed to several doses of Ecstasy "developed severe brain dopaminergic neurotoxicity, in addition to less pronounced serotonergic neurotoxicity." They concluded, "MDMA users may unwittingly be putting themselves at risk, either as young adults or later in life, for developing neuropsychiatric disorders related to brain dopamine and/or serotonin deficiency."

Una McCann and colleagues caution, too, that reports that Ecstasy damage may be at least partially reversible should not lead to a false sense of security. "Axonal regeneration in the adult brain may lead to abnormal, dysfunctional circuitry," they say, adding, "[Experimental studies report that MDMA's neurotoxic effects on serotonin neurons in primates are](#)

extremely long-lasting and may be permanent." McCann and George Ricaurte cite research showing that in the dorsal neocortex, the density of serotonin axons remains markedly reduced for up to seven years following exposure to Ecstasy.

Research by Lynn Taurah and Chris Chandler reported at the annual conference of the British Psychological Society, March 15, 2003. Quotes appear in "Single Ecstasy tablet could lead to brain damage and depression," L. McDougall, *Sunday Herald*, March 16, 2003, and "Ecstasy makes users depressed for life," S. Goodchild and K. Johnson, U. K. *Independent*, March 16, 2003.

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"Long-term effects of 'Ecstasy' use on serotonin transporters of the brain investigated by PET," *Journal of Nuclear Medicine*, Vol. 44, No. 3, March 2003, 375-84. Address: R. Buchert, Department of Nuclear Medicine, University Hospital Hamburg-Eppendorf, Hamburg, Germany.

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"Assessing long-term risks of MDMA (Ecstasy)," George Ricaurte and Una McCann, *The Lancet*, Vol. 358, No. 9296, December 1, 2001, 1831-2. Address: George Ricaurte, Johns Hopkins School of Medicine, Baltimore, MD 21224.

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"'Ecstasy' and serotonin neurotoxicity," U. McCann, G. Ricaurte, and M. Molliver, *Archives of General Psychiatry*, Vol. 58, October 2001, 907-8. Address: Una D. McCann, Department of Psychiatry and Behavioral Science, Johns Hopkins University School of Medicine, 725 N. Wolfe Street, Baltimore, MD 21205.

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"Human psychopharmacology of Ecstasy (MDMA): a review of 15 years of empirical research," A. C. Parrott, *Human Psychopharmacology*, Vol. 16, No. 8, December 2001, 557-77. Address: A. C. Parrott, Department of Psychology, University of East London, Romford Road, London, U.K. E15 4L2.

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"Severe dopaminergic neurotoxicity in primates after a common recreational dose regimen of MDMA ('Ecstasy')," G. A. Ricaurte, J Yuan, G. Hatzidimitriou, B. J. Cord, and U. D. McCann, *Science*, Vol. 297, September 2002, 2260-3. Address: George Ricaurte, Johns Hopkins University School of Medicine, Baltimore, MD 21224.