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NEWS

RSNA Press Release

Ecstasy Can Harm the Brains of First-Time Users

Released: November 27, 2006

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At A Glance

- The drug ecstasy may cause subtle brain cell damage and verbal memory loss in first-time users.
- This is the first study to measure the effects of low doses of ecstasy on the brain before and after first use.
- Approximately 5.4 percent of all American 12th graders have tried ecstasy.

CHICAGO — Researchers have discovered that even a small amount of MDMA, better known as ecstasy, can be harmful to the brain, according to the first study to look at the neurotoxic effects of low doses of the recreational drug in new ecstasy users. The findings were presented today at the annual meeting of the Radiological Society of North America (RSNA).

"We found a decrease in blood circulation in some areas of the brain in young adults who just started to use ecstasy," said Maartje de Win, M.D., radiology resident at the Academic Medical Center at the University of Amsterdam in the Netherlands. "In addition, we found a relative decrease in verbal memory performance in ecstasy users compared to non-users."

Ecstasy is an illegal drug that acts as a stimulant and psychedelic. A 2004 survey by the National Institute on Drug Abuse (NIDA) found that 450,000 people in the United States age 12 and over had used ecstasy in the past 30 days. In 2005, NIDA estimated that 5.4 percent of all American 12th graders had taken the drug at least once.

Ecstasy targets neurons in the brain that use the chemical serotonin to communicate. Serotonin plays an important role in regulating a number of mental processes including mood and memory. Research has shown that long-term or heavy ecstasy use can damage these neurons and cause depression, anxiety, confusion, difficulty sleeping and decrease in memory. However, no previous studies have looked at the effects of low doses of the drug on first-time users.

Dr. de Win and colleagues examined 188 volunteers with no history of ecstasy use but at high-risk for first-time ecstasy use in the near future. The examinations included neuroimaging techniques to measure the integrity of cells and blood flow in different areas of the brain and various psychological tests. After 18 months, 59 first-time ecstasy users who had taken six tablets on average and 56 non-users were re-examined with the same techniques and tests.

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The study found that low doses of ecstasy did not severely damage the serotonergic neurons or affect mood. However, there were indications of subtle changes in cell architecture and decreased blood flow in some brain regions, suggesting prolonged effects from the drug, including some cell damage. In addition, the results showed a decrease in verbal memory performance among low-dose ecstasy users compared to non-users.

"We do not know if these effects are transient or permanent," Dr. de Win said. "Therefore, we cannot conclude that ecstasy, even in small doses, is safe for the brain, and people should be informed of this risk."

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This research is part of the Netherlands XTC Toxicity (NeXT) study, which also looks at high-dose ecstasy users and aims to provide information on long-term effects of ecstasy use in the general population.

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RSNA is an association of more than 40,000 radiologists, radiation oncologists, medical physicists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill.

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