Oxycontin may hook teens more easily than adults

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NEW YORK (Reuters Health) - The powerful painkiller Oxycontin may be even more addictive for adolescents than it is for adults, new research in mice suggests.

Fewer U.S. teens are using illegal drugs, but the abuse of prescription drugs, such as Oxycontin (generic oxycodone) and Vicodin (generic hydrocodone) is rising, Dr. Mary Jeanne Kreek and colleagues from The Rockefeller University in New York City report.

The brain undergoes dramatic changes in adolescence, they add, and there is evidence that abusing opioids during this key developmental period may cause permanent brain alterations that increase the likelihood that a teen will be more vulnerable to addiction compared with those who first abuse this drugs as adults.

To better understand the brain chemistry and addiction risks involved in adolescent Oxycontin use, the researchers studied self-administration of the drug in 4-week-old, or "adolescent," mice and 10-week-old adults.

Previous research has shown that adult rodents given Oxycontin show increases in levels of the feel-good chemical dopamine in a part of the brain called the striatum, while dopamine levels drop below normal with repeated use of the drug.

In the current study, the researchers placed each mouse in a "self-administration chamber" for 2 hours daily. The rodents received an oxycodone infusion every time they poked their nose through a hole. All animals received the same 0.25 mg/kg dose every time for nine days.

The researchers then tested the effect of self-administered doses of 0.125 mg/kg, 0.25 mg/kg, 0.5 mg/kg, and 0.75 mg/kg in ascending and then descending order, as well as an infusion that did not contain the drug.

One week after the self-administration period, the animals taking oxycodone had lower levels of striatal dopamine than rodents that were given simultaneous doses of plain saline solution. When given the drug in different concentrations, the rodents' dopamine levels increased in tandem with the dose received.

The adult mice consistently gave themselves more doses of oxycodone than the adolescent mice. However, only the adolescent mice showed significant rises in dopamine levels in response to the lowest dose, suggesting that the animals were more sensitive to the drug's effects.

"Together, these results suggest that adolescents who abuse prescription pain killers may be tuning their brain to a lifelong battle with opiate addiction if they re-exposed themselves to the drug as adults," Kreek said in a press release from Rockefeller accompanying the study. "The neurobiological changes seem to sensitize the brain to the drug's powerfully rewarding properties."

SOURCE: Neuropsychopharmacology, online September 10, 2008.