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The effect of low dose adolescent amphetamine on adult cross-sensitization to methamphetamine.

The use of ADHD medicines has increased due to overprescription and trending recreational use, especially in adolescents. Repeated exposure to amphetamine psychostimulants produces neural and behavioral adaptations that contribute to addictive behavior. Adolescence is a time of physical, mental, and emotional development. This study assessed long-term neural changes in adulthood, expressed as behavioral cross-sensitization in an open field chamber, caused by exposure to amphetamines during adolescence. C57Bl/6J mice were treated with low doses (0.01, 0.1, or 1 mg/kg) of amphetamines for 10 days during a period of early adolescence (P22-P31), followed by a washout period until adulthood (P90) and challenged with a sub-acute dose of methamphetamine (METH). Overall results indicate that adolescent animals injected with both 1.0 and 0.1mg/kg of amphetamine show increased locomotor activity following a METH challenge. However, activity in the 0.01 mg/kg group was not different from controls, suggesting this low dosage does not produce persistent long-term changes in the brain. Our results reflect a human model of early teenagers taking prescription amphetamines to treat ADHD, but who do not actually have the disorder, are at risk to sensitization to methamphetamine as adults even if they are using a very low therapeutic dose.