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ABSTRACT FORM

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Enhancement of behavioral sensitization development to methamphetamine in prenatally buprenorphine exposed offspring

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Heroin use among young women of reproductive age has drawn much attention around the world. However, there is a lack of information on long-term effects of prenatal exposure to opioids on the offspring. In our previous study, we established a prenatally opioid-exposed model, and have shown that animals prenatally exposed to morphine, methadone, or buprenorphine developed tolerance to morphine faster than their controlled mates. Especially, severe changes occurred in prenatally buprenorphine-exposed offspring. In this study, we used the prenatally opioid-exposed animal model to study effects of methamphetamine on behaviors of the offspring at their adulthood. The results showed that there was no difference with basal exploratory behavior and acute methamphetamine induced locomotor activity in all groups tested. When the male offspring received methamphetamine, 2 mg/kg, i.p., once a day for 5 days, the behavioral sensitization was induced. Furthermore, the locomotion was significantly increased in prenatally buprenorphine-exposed group than other opioid prenatally exposed groups. In addition, fast development rate (slope) to methamphetamine-induced behavioral sensitization in prenatally buprenorphine-exposed animals was also observed. In the environment associated with reward test, prenatally buprenorphine-exposed offspring showed more sensitive to lower dose of methamphetamine in conditioned place preference test. These results indicate that prenatal exposure to higher dose of buprenorphine caused long-term effects on the offspring and may affect the dopamine system related reward system.

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