Nelson, Tyler

T.M. Nelson; M. Cheng; M.G. Gomez; A.R. Zavala. Department of Psychology, California State University Long Beach

ADOLESCENT MALE, BUT NOT FEMALE, SPRAGUE-DAWLEY RATS EXHIBIT ETHANOL PREFERENCE USING LOW DOSES

Background: Alcohol is the most commonly abused recreational drug in the United States. The use of alcohol is present across all age groups, but the use of the drug begins during adolescence. Preclinical research using the conditioned place preference (CPP) paradigm, a validated animal model of drug reward, has been used to examine ethanol-induced CPP, but there are few studies, and the results yield inconsistent results. Generally, adolescent rats do not readily demonstrate ethanol-induced CPP, but the effect varies across adolescence and is dose-dependent. Recently, we showed early adolescent rats demonstrate ethanol-induced CPP using a low dose of ethanol (0.125 g/kg), but no CPP with higher doses (0.5 and 1.0 g/kg). The latter suggests that the dose of ethanol, and particularly low doses, may be necessary for adolescent rats to exhibit ethanol-induced CPP. In the present study, we examined ethanol-induced CPP in adolescent rats using a wide range of low doses of ethanol (0.0156, 0.0313, 0.0625, 0.125, 0.5, or 2.0 g/kg).

Methods: Male and female adolescent rats (postnatal day [PD] 31) underwent a 10-day CPP procedure. Specifically, on days 1 and 10, rats were tested for their preconditioning and postconditioning place preferences, respectively, during 20-min sessions. On days 2-9, rats were conditioned for 15-min with saline or ethanol on alternating days. During ethanol conditioning days, rats were randomly assigned to receive an injection of ethanol (0.0, 0.0156, 0.0313, 0.0625, 0.125, 0.5, or 2.0 g/kg, intraperitoneally).

Results: In males, rats that were administered ethanol (0.0625 or 0.125 g/kg) exhibited ethanol-induced CPP, whereas lower or higher doses of ethanol failed to produce ethanol-induced CPP in male rats. In contrast, female rats did not demonstrate ethanol-induced CPP at any dose of ethanol.

Conclusion: Overall, these results extend our previous finding that low doses of ethanol are necessary to produce ethanol-induced CPP in adolescent rats, which typically do not exhibit robust ethanol-induced CPP. Establishing preclinical models that allow for the examination of ethanol reward in adolescence is crucial in being able to understand the neurobiological mechanisms that underlie ethanol abuse in adolescence.