

Methylphenidate (MPD), the active ingredient in Ritalin™, is a prescription ADHD stimulant. MPD increases levels of dopamine in the synaptic cleft leading to changes with movement and reward processing. Given the importance of dopamine signaling during developmental critical windows, this study explores neurobiobehavioral alterations resulting from adolescent MPD exposure using conditioned place preference (CPP) and behavioral sensitization paradigms. CPP involves the development of drug-paired associations to environmental features while sensitization tracks motor output in an open field chamber (OFC) that is heightened as a result of chronic stimulant exposure. Behavioral sensitization and CPP indicate underlying neural circuitry changes and are hallmarks of addiction and future drug susceptibility. We hypothesize that adolescent MPD exposure will induce CPP sensitization indicating an increased susceptibility to future drug use. We also hypothesize that adolescent exposure to MPD will produce sexually dimorphic responses. Adolescent mice began the CPP paradigm with habituation on (postnatal day(P22-23)), pre-conditioning (P24-25), conditioning (P26-30), and testing for drug-pair chamber preferences (P31). On P90 the persistence of drug-paired chamber associations will be assessed using a second CPP test. On P91, the persistence of sensitization to stimulant drugs using the OFC will also be assessed. This study shows neurological changes in adolescents will sustain into adulthood. These changes also contribute to a female specific cross sensitization to Methamphetamine. Clinical implications include a possibility of discontinuing MPD prescriptions to females due to increased sensitization or reducing prescription rates of medications containing MPD to adolescents until major developmental changes have all occurred successfully.