Evaluating the Effects of Perinatal Fluoxetine in Mice in Response to Fear Stimuli

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Roughly 3% of all pregnant women consume selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine, to ameliorate symptoms of depression. SSRIs can be transmitted to the fetus through the placenta, and can elevate serotonin levels during a highly sensitive period of brain development. It has been shown in animal models that administering fluoxetine perinatally (PNFLX) between postnatal day 2 to 11, equivalent to the 3rd trimester of human pregnancy, is correlated with anxiety and other psychological disorders later in life. To investigate further the early effects of serotonin on development of fear and anxiety in adulthood, I analyzed video recordings of mice that were treated with fluoxetine between days 2-11 postnatally or given saline. These mice were allowed to develop to adulthood, then exposed to a novel environment to habituate. This environment had 3 separate zones: safe, neutral, and predator. A predator odor was placed into the predator zone in the second exposure, and mice were put in the same environment as before with the addition of the odor. Treatment and handling of mice were performed by a trained scientist. I performed a granular analysis of fear behavior postures of recordings using DeepLabCut, an automatized pose estimation tool. It was found that PNFLX mice were more immobile and stretched significantly less than their saline counterparts. These data suggest that PNFLX animals display more passive and defensive behaviors in response to a potential predator odor threat.

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