



Center for Behavioral Health Studies

Study Finds Effects on Behavior and Brain Chemistry from MDMA Exposure

Women of childbearing age are among the population most involved with MDMA, (methylenedioxy-methamphetamine), better known as ecstasy. The consequences of prenatal exposure to this drug is an increasing concern to treatment providers, such as Rimrock Foundation.

National Institute on Drug Abuse (NIDA) studies have demonstrated long-term behavioral abnormalities in animals exposed to MDMA during the mid to late gestational period. Documented research has shown marked behavioral abnormalities in rats exposed to MDMA during their early in-utero life.

Researchers have now statistically correlated the exposed rats' abnormal behavior starting at 21 days of age with major alterations in brain neurotransmitter systems.

Research Design

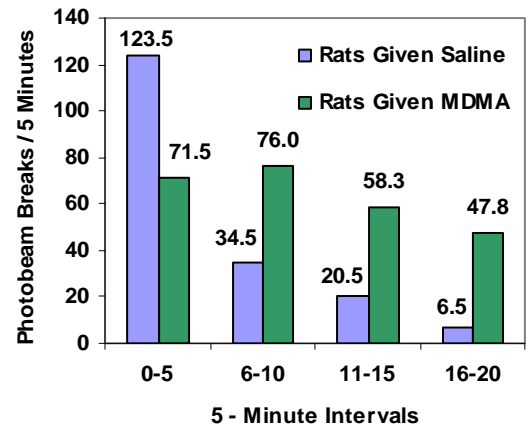
Pregnant albino rats were given MDMA, equivalent to a human recreational dose twice daily when the animals were pregnant. During this time period, gestating animals pass through a critical brain developmental stage, corresponding to early pregnancy in humans. It is at this critical point that dopamine and serotonin brain neurotransmitter systems first take shape.

Dopamine is critically involved in motivated behaviors, including attention, sex, and drug taking, while serotonin helps regulate mood, sleep, and appetite.

In the behavioral tests, scientists examined the baby rats' adaptation to a new environment. Researchers introduced the animals into an unfamiliar cage that was equipped to monitor the animals' ambulatory and fine motor movements.

They found that at 21 days of age, the animals prenatally exposed to MDMA adapted more slowly to their new environment and exhibited more activity than the unexposed rats.

Rats Prenatally Exposed to MDMA Are More Active Than Unexposed Rats



Rats prenatally exposed to MDMA and those from a control group were each placed in a new cage. MDMA exposed rats were seven times as active as the control group rats.

After 20 minutes, the MDMA exposed rats still maintained a 35% increase over their normal activity level. In contrast, the activity level in the control group fell off precipitously after the first 5 minutes of the trial as they adjusted to the new cage.

In additional work, researchers also sought to determine whether prenatal exposure to MDMA had altered the dopamine nerve fiber density in the brain.

Findings show that fiber counts in the frontal cortex of the prenatally exposed animals had increased 502% more than normal. Abnormal or excessive connections in the frontal cortex can result in aberrant signaling, possibly leading to abnormal behavior.

Summary

In summary, reductions in prenatally exposed rats' dopamine and serotonin metabolism result in a marked inability to adjust to a new environment.

This test demonstrates for the first time that prenatal MDMA exposure can result in both behavioral and correlating neurochemical alterations. This evidence suggests that prenatal MDMA exposure has

an impact on neurochemical development in animals and very probably in humans as well.

Rimrock Foundation's Clinical Director, Mona Sumner, observes, "that the consequences of prenatally exposed children to MDMA is a major medical concern".

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