

Fetal X-ray exposure interferes with memory in adulthood

July 6 2010

Learning and memory impairments are important contributors to the disability associated with schizophrenia. These functional impairments emerge long before the onset of other symptoms associated with schizophrenia, suggesting that they are a consequence of a disturbance in brain development.

In order to investigate the impact of early life disturbances in brain development upon learning and memory, researchers at the Yale University School of Medicine conducted a study that required a remarkable degree of commitment and planning. They exposed fetal monkeys to x-rays and then examined their behavior when they were adults, approximately 5 years later.

They found that irradiated adult monkeys exhibited a profound deficit in [working memory](#) ability compared to adult monkeys that had not been exposed to x-rays. Notably, these same irradiated monkeys had not shown any working [memory impairment](#) when tested as juveniles (1 - 2½ years old). These findings suggest that this relatively mild insult to the developing brain early in gestation, even before cortical neurons are generated, produced profound [cognitive dysfunction](#) that emerged only with maturation to adulthood.

"Our non-human primate study mirrors what has been observed in human populations: that mild prenatal stressors increase the risk for developing neuropsychiatric illness in adulthood," explained Dr. Selemon.

It is important to note that this study evaluated the effects of exposure to x-rays at a much higher level than would be associated with the typical x-ray, so the authors do not suggest that typical clinical x-ray exposures cause schizophrenia in humans.

However, notes Dr. Selemon, "this study reaffirms the importance of the early gestational period as a critical window of vulnerability to environmental factors that may have adverse effects on [brain development](#) and insidious consequences for [brain function](#)."

More information: The article is "Fetal Irradiation Interferes with Adult Cognition in the Nonhuman Primate" by Harriet R. Friedman and Lynn D. Selemon. The authors are affiliated with the Department of Neurobiology, Yale University School of Medicine, New Haven, Connecticut. The article appears in *Biological Psychiatry*, Volume 68, Issue 1 (July 1, 2010)

Provided by Elsevier

Citation: Fetal X-ray exposure interferes with memory in adulthood (2010, July 6) retrieved 27 April 2024 from

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