

# Expectant mom's flu exposure stunts baby's brain development

January 25 2010, by Terry Devitt

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(PhysOrg.com) -- For expectant mothers, catching even a mild case of the flu could stunt brain development in their newborns, according to a new study conducted in rhesus macaques.

Writing in the most recent online edition (Jan. 22) of the journal [Biological Psychiatry](#), a team led by Christopher Coe of the University of Wisconsin-Madison reports that flu infections in pregnant monkeys resulted in significant reductions in [gray matter](#) in baby monkeys, particularly in areas that in humans are associated with language, and the combining of information from different senses.

"The effects were greater for gray matter, which reflects cell number and size in the cortex, but we did see some reductions in [white matter](#), too," explains Coe, a UW-Madison professor of psychology and the director of the Harlow Center for Biological Psychology.

The new findings are telling because they demonstrate that risk to expectant mothers from common disease can shape postnatal development and elevate the risk of behavioral and [psychiatric disorders](#) later in life. It has been estimated that as many as 11 percent of pregnant women become infected with influenza during pregnancy.

The new study explored the effects of mild [influenza](#) infections in 12 pregnant macaques compared with seven control pregnancies. The offspring of both groups were subjected to structural [magnetic resonance imaging](#) of their brains at one year of age.

In the year-old offspring of animals exposed to a strain of seasonal flu that also commonly infects humans, the team led by Coe found a 4 to 7 percent reduction in the number of cells in regions of the [brain](#) that compose the [cerebral cortex](#) compared to animals whose mothers did not have an infection during pregnancy.

Finding the differences in brain size still present at 1 year of age, Coe notes, suggests the effect may be permanent. "Our feeling is that if it is still there at 1 year, it's not going to go away," he says.

The study, which was conducted in collaboration with Sarah J. Short and John Gilmore from the University of North Carolina at Chapel Hill, is suggestive that flu exposure in utero may contribute to developmental and psychiatric conditions such as autism and possibly to schizophrenia later in life.

"We think the causation (of the reduction in brain volume) is the mother's response to the infection and that it may skew the developmental trajectory of the brain," Coe explains. "It's a cautionary tale for humans, especially in the context of clinical studies in people and what we know from studies of rodents."

Coe and his colleagues, including Christopher Olsen from the UW-Madison School of Veterinary Medicine, speculate that the [flu infection](#) affects the developing fetus indirectly through the mother's inflammatory and immune response to the virus. In primates, including humans, the inflammatory response is more pronounced in the third trimester of pregnancy, the time when the animals in the new study were infected.

The take-home message of the research, Coe argues, has compelling public health implications: Pregnant women or those who expect to conceive during flu season should be vaccinated. [Flu](#) vaccinations are

widely regarded in the medical community and by the U.S. Centers for Disease Control (CDC) as safe for pregnant women.

"The safe thing to do is to get vaccinated," says Coe. "This study would say that's the smarter and healthier choice."

Provided by University of Wisconsin-Madison

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