

Flu during pregnancy may lead to changes in offspring's immune function

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A new study in mice suggests that having a common form of the flu during pregnancy may affect the next generation by impairing immune function in the gut. The study is published ahead of print in the

American Journal of Physiology-Gastrointestinal and Liver Physiology under the title "Influenza A virus infection during pregnancy causes immunological changes in gut-associated lymphoid tissues of offspring mice."

The influenza A virus, also known as the flu, is an infection centered in the respiratory system. Common symptoms of this type of flu include sore throat, coughing, sneezing, body aches and fever. The virus can cause serious complications in pregnancy and may sometimes be fatal.

Although influenza A does not cross the placenta and does not directly infect the fetus, pregnant people who are infected with influenza A may have an increased risk of giving birth prematurely to babies with low birth weights. However, not much is known about the later-in-life health status of babies born to parents who had the flu during pregnancy.

In a new study, researchers studied a mouse model of influenza A during pregnancy. The research team looked at gut-associated [lymphoid tissue](#) (GALT) samples of offspring born to flu-infected female mice. GALT is a significant component of the mucosal immunity in the digestive tract and is representative of the body's [immune system](#) as a whole. GALT is present in the small intestine, the appendix and the cecum, a small pouch located at the beginning of the large intestine.

The research team found that the influenza A virus affected the offsprings' gut physiology in a variety of ways:

- an increase in [white blood cells](#) in the cecum,
- an increase in expression of pro-inflammatory proteins involved in the [immune response](#), and
- activation of CD4 T cells—a type of immune cell—in the [small intestine](#).

Flu infection did not lead to anatomical changes in the gastrointestinal system, such as body weight or intestinal length.

Previous research has suggested that flu-induced immune activation in a parent during their pregnancy is associated with "atypical neurodevelopment" in offspring, but because influenza A does not cross the placenta, the reasons for this phenomenon are still unknown.

Further study will help determine if having the flu during pregnancy might change the cecal microbiome in offspring and if so, "how such changes might affect the crosstalk within the gut-brain axis and potential contributions to gestational [[influenza A](#)]-induced neurological disorders in the offspring," the researchers wrote.

More information: Stella Liong et al, Influenza A virus infection during pregnancy causes immunological changes in gut-associated lymphoid tissues of offspring mice, *American Journal of Physiology-Gastrointestinal and Liver Physiology* (2023). DOI: 10.f/ajpgi.00062.2023. [journals.physiology.org/doi/ab ...
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