

# Morning sickness is pregnancy 'wellness insurance'

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Morning sickness. It's the bane of many of a pregnancy. And many a future mother wonders at the apparently unnecessary suffering.

But, it turns out, there's meaning to the misery. Two evolutionary biologists report that morning sickness protects both the pregnant woman and the developing embryo just when the fetus is most vulnerable.

After testing the two dominant theories (one adaptive and the other non-adaptive) for why two-thirds of women around the world -- but seemingly no other mammals -- experience nausea and vomiting in pregnancy, only one holds water, says Paul Sherman, Cornell professor of neurobiology and behavior and a Weiss Presidential Fellow.

"Our study, which tested theories and predictions about the nature of parent-offspring conflict in human pregnancy, shows that nausea and vomiting in pregnancy is beneficial by expelling such foods as meat and strong-tasting vegetables that historically and still may contain harmful toxins and microorganisms that could potentially sicken the woman and damage her fetus just when its organs are developing and are most vulnerable to chemicals," said Sherman, who is an expert in Darwinian medicine -- viewing diseases from an evolutionary perspective.

His study, conducted with University of Colorado evolutionary behaviorist Samuel M. Flaxman '98, Ph.D. '05, who worked as a postdoctoral researcher at Cornell from 2005 to 2007, is published in the July issue of *The American Naturalist*.

Other evidence that the theory that morning sickness is protective and beneficial, he said, includes:

- The nausea and vomiting declines after 18 weeks of pregnancy, as the fetus becomes less vulnerable to the effects of chemical disruptions.
- Women with the most severe morning sickness have lower rates of spontaneous abortion than other pregnant women.
- Historically, meat and strong-tasting vegetables were likely to contain parasites, pathogens and plant toxins; these foods tend to reliably trigger morning sickness symptoms across cultures. Alcohol and cigarette smoke, which also can harm the fetus while organs are forming, also trigger the nausea.

Societies that consume more meats, strong-tasting vegetables and alcohol have higher rates of morning sickness than societies whose staples are bland plant products.

- Only humans experience morning sickness, as far as is known, because, the researchers suggest, of their "extraordinary broad diet," compared with other primates and mammals.

If the alternative theory that morning sickness is a non-adaptive outcome of an evolutionary tug-of-war between the mother and fetus for resources were correct, then the nausea should peak in the final trimester, when the fetus requires more nutrients and blood than at any other time. But it doesn't. Neither does it occur with every pregnancy. If morning sickness were the result of the fetus signaling its viability to the mother, then all humans and other mammals should experience it.

"All this leads us to suggest that morning sickness is a misnomer," Sherman said. "It doesn't occur just in the morning, and it's not an illness. It can occur any time of day and it appears to be beneficial -- we could call it a form of evolutionary wellness insurance."

The current study builds on a 2000 paper published in the Quarterly

Review of Biology in which Sherman and Flaxman studied the outcomes of thousands of pregnancies. In that study, they noted, for example, that in the seven traditional societies that had virtually no morning sickness, the diets were based on bland, plant-based foods rather than meats and strong-tasting vegetables.

Source: Cornell University

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