

Expectant mothers' saliva tells stories of stress

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Credit: co.wayne.ny.us

This weekend, many mothers-to-be celebrated Mother's Day, a welcome relief from the inherent stresses of pregnancy.

Getting a handle on the stress can be difficult, but the answer may lie in testing an easy-to-collect, readily available body fluid.

Researchers at Johns Hopkins University have found saliva is useful for a whole slew of [medical tests](#), including measuring the patterns of stress in pregnant women. It can be used to monitor [cardiovascular risk](#) and could be a cheap way of doing [DNA testing](#).

Saliva gets little respect. Few researchers spend much time studying it, although it really is useful stuff.

Saliva moistens food to make it easier to swallow. It contains chemicals that turn starch into sugar, the beginning of the [digestive process](#). It wets and cleans the tongue to make food taste more dynamic. Saliva contains antibacterial substances that help clean teeth and prevent mouth infections. And, it contains multiple hormones and enzymes that can be measured.

Doctors in Quebec, for instance, have found that [saliva tests](#) are just as accurate as blood tests for detecting HIV. Other researchers are working on saliva tests for various cancers, including pancreatic, which now is almost impossible to detect before it is too late.

[Forensic scientists](#) find it increasingly useful in criminal cases.

In pregnant women, the researchers are studying a substance called salivary or sAA, a marker for the [autonomic nervous system](#), which controls involuntary bodily functions, said Douglas Granger, director of the Center for Interdisciplinary Salivary Bioscience Research at Hopkins, working with colleagues at the University of Calgary in Alberta.

"Levels increase when bodies experience autonomic nervous system arousal," he said. "Think of the fight-or-flight impulse."

Using saliva tests on 83 pregnant women, Granger and his colleagues found that the levels of sAA varied predictably through the course of the pregnancy, and varied predictably through the course of a day. When the pattern was unpredictable, factors included whether the woman had previously miscarried, which would create even more stress.

The research has been published online in the journal [Developmental Psychobiology](#).

"The levels changed across different trimesters and within each day," Granger said. "The levels were associated with the emotional states."

It didn't matter if the arousal was positive or negative; when emotions increased, so did sAA.

SAA isn't the only marker found in saliva that can note stress in pregnancy. Hormones such as cortisol can be signs of stress as well, according to researchers at the University of Miami School of Medicine.

"We have shown that cortisol levels in depressed or stressed [pregnant women](#) are significantly predictive of preterm delivery and related to intrauterine growth delays," said Tiffany Field, research professor of pediatrics and director of the Touch Research Institute at Miami.

Specifically, the Miami researchers are looking to see whether cortisol and amylase affects the flow of blood to the fetus, which would interfere with the delivery of oxygen and nutrients.

Granger said the benefits of saliva tests were that they were non-intrusive and painless. The subject spits into a cup, and very small quantities can produce large results.

In another experiment, his lab measured how relationships with fathers could stress daughters. The levels of cortisol in saliva went up when the daughters discussed unhappy relationships.

His lab also has tested saliva samples for C-reactive protein, or CRP, which is linked to diabetes, hypertension, and cardiovascular disease. The more CRP the more at risk a person is for a heart attack, and that measurement would be especially useful if the person is not considered high risk. One third of people who die suddenly from heart attacks never knew they had a problem.

Granger said more people might be willing to take saliva tests rather than go to a medical lab or a physician and get stuck with a needle. You just collect the saliva at home and mail it to a lab.

Source: Inside Science News Service

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