Stress experienced by pregnant women affects long-term health of offspring

A new study by researchers at the University of Lethbridge and McGill University provides further confirmation that stress experienced by pregnant women has a lasting impact on the health of their children.

The study, published in *Nature – Scientific Reports,* by Dr. Gerlinde Metz, a neuroscientist at the Canadian Centre for Behavioural Neuroscience, in collaboration with Tony Montina, NMR (nuclear magnetic resonance) manager, and several graduate and undergraduate students, was completed on 32 adolescents, both male and female, born to mothers who lived through the Great Ice Storm of 1998. NMR spectroscopy done on urine samples showed higher risks of metabolic illness such as insulin resistance, diabetes and obesity later in life.

The Great Ice Storm left more than four million people without electricity, some of them for more than a month. Eastern Ontario and southern Quebec were especially hard hit. Project Ice Storm was set up by Dr. Suzanne King, a professor of psychiatry at McGill, in the aftermath of the storm to build understanding about the effects of prenatal exposure to stress on children's development. Nearly 180 pregnant women signed up and researchers have been following their children's development in subsequent years.

"In this study, two metabolic pathways were affected in both males and females," says Montina. "These pathways are implicated throughout the literature and all the studies in the risk of the development of diabetes and obesity."

While the results point to health risks for offspring later in life, Metz says that identifying risks to health is the first step to creating effective therapeutic interventions to minimize them.

"If predisposition to these diseases has been programmed through adverse experience, potentially we can mitigate this risk by beneficial experiences," says Metz. "So, we hope that through environmental and lifestyle interventions and recommendations, we can reduce the risk of these diseases early on before they come on board."

Similar results have been shown in epigenetic studies but the benefits of studying urine samples, or even blood, saliva or hair samples, is that they can provide the same results using a noninvasive technique that's far less expensive than epigenetic testing.

"Metabolomic downstream biomarkers that are much easier to obtain in a clinical setting, much cheaper to work with and to process and analyze, hold great potential to triage and diagnose these children who are at risk of developing disease later in life due to adverse experiences in utero or early in life," says Montina.

The research is very timely, given climate change and the increasing incidence of natural disasters like wildfires and floods.

"We are moving towards personalized medicine and preventative medicine that can help to intervene early in a lifetime," says Metz. "We do have adverse environments, such as pollutants in the air and water, and adverse experiences that interact with our health. We really need to push forward in understanding how the environment interacts with our health at the basic research level. We also have to take the health-care research step and try to understand, at the biomedical stream of investigation, how we can predict these diseases, diagnose them and intervene."

This news release can be found online at Prenatal Stress.

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