

Consumption of artificial sweeteners during pregnancy puts offspring at increased risk of obesity

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A study of over 2,200 Canadian mothers and babies has shown that the consumption of artificially sweetened beverages during pregnancy may place children at an increased risk of obesity at age three.

The research, published today in the [International Journal of Obesity](#), provides new evidence on the potentially adverse effects of artificial or non-nutritive sweeteners (NNS), which are typically marketed as “healthier” alternatives to caloric sweeteners, especially for the purposes of weight management and diabetes control.

“Typically, we think of sugar as the ‘bad guy,’ but it turns out that replacing sugar with NNS may not be such a good idea,” said Dr. Meghan Azad, an associate professor and Canada Research Chair in Developmental Origins of Chronic Disease in the Rady Faculty of Health Sciences at the University of Manitoba, and a research scientist at the Children’s Hospital Research Institute of Manitoba (CHRIM).

“Our study found that children born to mothers reporting daily consumption of artificially sweetened beverages (diet pop or NNS added to coffee or tea) during pregnancy had significantly higher body mass index (BMI) at three years of age compared to children born to mothers who did not consume NNS beverages.”

In the study, 29.9% of mothers reported consuming any NNS beverages during pregnancy and 5.2% consumed them daily.

The 2,298 mother-baby pairs involved in the research are participating in the [CHILD Cohort Study](#) (CHILD), a world leading birth cohort study in maternal, newborn and child health research. The findings build upon Dr. Azad’s [previous research in the CHILD cohort](#) that linked prenatal daily NNS beverage consumption with a twofold higher risk of a baby being clinically overweight by the first birthday.

In the current study, the researchers also conducted experiments with mice and cell cultures to establish a causal link and learn how maternal NNS intake impacts the offspring’s weight. In mice, the researchers found that maternal NNS intake during pregnancy caused elevated body weight, an accumulation of body fat, and insulin resistance in the offspring, especially in males.

Dr. Vernon Dolinsky, an associate professor in the Rady Faculty of Health Sciences at the University of Manitoba and a research scientist at CHRIM, led the animal and cellular studies.

“Comparing intake of aspartame and sucralose sweeteners during pregnancy to no sweetener, we found that aspartame caused a 47% increase in body fat in young male mouse offspring, while sucralose caused a 15% increase in body fat,” he said.

The study is unique since the pregnant mice were given doses of NNS that are relevant to human consumption during pregnancy. “Previous animal studies used doses that exceeded the acceptable daily intake – somewhere around the equivalent to 20 packets of NNS or 12 cans of diet soda per day in people,” added Dr. Dolinsky.

Cell studies also confirmed their findings that NNS exposure had a significant effect on increasing fat accumulation.

“By triangulating evidence from humans, mice, and cells, this study provides new evidence that maternal NNS consumption during pregnancy may program obesity risk in offspring,” said Dr. Azad.

Until further research provides more definitive answers, the researchers caution pregnant women to limit their intake of NNS. “It doesn’t add any nutritional benefit, and, if it becomes a habit, could potentially be harmful. Unsweetened drinks like water are the best option,” said Dr. Azad.

About the CHILD Cohort Study: Launched in 2008 by CIHR and AllerGen NCE, the [CHILD Cohort Study \(CHILD\)](#) is tracking nearly 3,500 Canadian infants and their families to help determine the root causes of chronic diseases such as asthma, allergies and obesity. CHILD spans four provinces, involving over 140 multidisciplinary researchers, students and research staff. [Watch the CHILD Cohort Study videos.](#)

About the Children’s Hospital Research Institute of Manitoba: The Children’s Hospital Research Institute of Manitoba was established in 2001. [CHRIM](#) is the research division of the Children’s Hospital Foundation of Manitoba. At the Institute, more than 270 world-class pediatric medical researchers, technical staff, students and support staff are involved in over \$20 million of research and clinical trial activity each year.

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