

For immediate release

Antibiotic use during birth affects infant gut microbiota

HAMILTON, ON (13 October 2015)

Infants of Canadian women who received antibiotics during labour or delivery were more likely to have an altered gut microbiome, according to new research from the [Canadian Healthy Infant Longitudinal Development \(CHILD\) Study](#).

[The study](#), published in *BJOG: An International Journal of Obstetrics and Gynaecology*, found that antibiotics used during delivery—whether caesarean or vaginal—were associated with changes in infant gut bacteria at three months of age, and that breastfeeding modified some of these effects when infants were 12 months old.

“Antibiotics are commonly administered to mothers during birth to help protect infants from Group B *Streptococcus* (GBS) infection,” says the study’s senior author, Dr. Anita Kozyrskij, an AllerGen investigator and professor in the Department of Pediatrics at the University of Alberta. “In North America, prophylactic antibiotics are given to all women with a positive vaginal culture for GBS, while some European countries base antibiotic treatment decisions on other risk factors. Our research provides evidence that exposing newborns to antibiotics disrupts their initial gut colonization at a critical time when a baby’s immune system is being established.”

The researchers collected data from 198 children participating in the CHILD Study. DNA sequencing techniques performed in the laboratories of James Scott, a co-Principal Investigator, and David Guttman at the University of Toronto provided information on the types and quantity of bacteria present in the infants’ stool. Information on maternal exposure to antibiotics and mode of delivery were obtained from hospital records, and breastfeeding was reported by mothers.

A total of 43% of mothers received prophylactic antibiotics for GBS during delivery—21% during vaginal delivery; 13% during emergency caesarean-section; and 9% during elective caesarean-section— while 57% had a vaginal delivery with no antibiotics.

At three months of age, infants born to women who received antibiotics during delivery had significant alterations in their microbiota, including a lower abundance of Bacteroidaceae and higher abundance of Clostridiales compared to infants whose mothers did not receive antibiotics. These differences persisted at 12 months of age among infants who were not exclusively breastfed for at least the first three months of life.

“Our findings provide new evidence that breastfeeding can modify antibiotic-induced microbiota changes,” says Dr. Meghan Azad, lead author of the study, research scientist at the Children’s Hospital Research Institute of Manitoba, and an AllerGen investigator. “Eventually, we hope to determine whether these antibiotic-induced changes in microbiota are associated with the development of obesity or allergic disease in children. We also plan to further explore how breastfeeding can minimize the adverse effects of antibiotic use, since there are times when it cannot be avoided.”

This research was supported by the Canadian Institutes of Health Research (CIHR).

The CHILD Study, funded by AllerGen NCE and the Canadian Institutes of Health Research (CIHR), involves more than 3,500 infants and their families from across Canada who are being closely monitored to determine how genetic and home environment factors contribute to health outcomes, especially with regard to allergies and asthma.

About AllerGen NCE Inc.

[AllerGen NCE Inc.](http://allergen-nce.ca), the Allergy, Genes and Environment Network (est. 2004), is a national research network dedicated to improving the quality of life of people suffering from allergic and related immune diseases. Funded by Industry Canada through the federal Networks of Centres of Excellence (NCE) Program, the Network is hosted at McMaster University in Hamilton. Visit <http://allergen-nce.ca> for more information.

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