Four major allergies may have shared bacterial origin

Several major childhood allergies may share a common link to the community of bacteria living in our gut, according to a new study led by CHILD researchers.

The research, published in *Nature Communications*, identifies patterns of gut bacteria and early-life influences associated with children developing allergies by age five. The findings could lead to methods of predicting if a child will develop allergies, and even to preventing them from developing.

“Hundreds of millions of children worldwide suffer from allergies, including one in three in Canada. It’s important to understand why this is happening and how it can be prevented,” says CHILD Co-Director Dr. **Stuart Turvey**.

The study examined four school-age pediatric allergies at once: atopic dermatitis (eczema), asthma, food allergy and allergic rhinitis (hay fever). While these allergic diseases often have unique symptoms, the Turvey lab was curious if they might have a common origin linked to the infant gut microbiome (the community of bacteria living in a baby’s digestive tract).

BACTERIAL "SIGNATURE" FOUND IN STOOL

The researchers examined the data from over 1100 CHILD participants tracked from birth to age five. Roughly half had no evidence of allergies at any time, while the rest were diagnosed with one or more allergic disorders by an expert physician at five years. The researchers evaluated the participants’ microbiomes from stool samples collected at three months and one year.

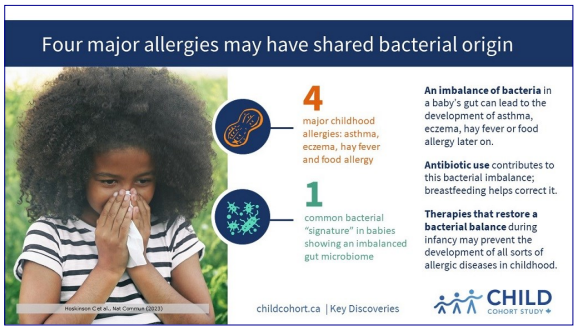
The stool samples revealed a bacterial signature that was associated with children developing any of the four allergies by five years of age. The signature is a hallmark of dysbiosis, or an imbalanced gut microbiota, that may make the gut more prone to immune reactions.

“Typically, our bodies tolerate the millions of bacteria living in our guts because they do so many good things for our health. For example, they keep a strong barrier between them and our immune cells and limit immune reactions,” says **Courtney Hoskinson**, first author on the paper. “We found a common breakdown in these mechanisms in babies before the development of allergies.”

A PATHWAY TO PREVENTION

The researchers hope to use the findings to create treatments that correct microbiome imbalances and potentially prevent allergies from developing.

“Developing therapies that change these interactions during infancy may prevent the development of all sorts of allergic diseases in childhood, which often last a lifetime,” says Dr. Turvey.



CHILD COHORT STUDY

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