

Babies exposed to antibiotics are more likely to get eczema

Research from CHILD found that babies who are exposed to antibiotics in the first year of life are more likely to later develop atopic dermatitis, or eczema.

The connection lies in the bacteria of the infant's gut: its microbiome, which can be disrupted by antibiotic use.

Because eczema is often the starting point for the development of other allergic disorders, this finding points to possible preventive strategies for allergic disease more generally.

For this study, published in the [Journal of Allergy and Clinical Immunology](#) (JACI), researchers in the labs of CHILD Director Dr. **Padmaja Subbarao** and Co-Director Dr. **Stuart Turvey** started by further investigating an association revealed by earlier research. They had noticed that children who experienced severe respiratory infections as babies had a higher risk of later developing eczema, but they weren't sure why.

CURE WORSE THAN THE DISEASE?

"The link between early respiratory infection and eczema was robust, suggesting that either the infection or its treatment was responsible," comments co-lead author **Maria V. Medeleanu**.

When they looked closely at the role of antibiotic use, they found it to be the key factor: "Using mediation modeling, we detected that systemic antibiotic use had a significant effect on later eczema development," adds co-lead author **Courtney Hoskinson**.

To explore this further, they looked at all the kids in CHILD who had been assessed for eczema at

age five. They found a high overlap between the 365 kids diagnosed with eczema at five and the 516 who had received treatment with antibiotics—for any reason—during their first year. Early antibiotic use was consistently linked to a higher eczema risk, suggesting that it was the antibiotics, not the infection, that was making the difference.

SHARED PATTERNS IN POOP

Previous CHILD research had already shown that systemic antibiotics taken in early life can have negative health effects because of their impact on our microbiome.

Knowing this, the researchers analyzed the stool samples collected at one year of age from the kids they were comparing. They found a distinct pattern shared by both groups of kids in the abundance of different types of gut microorganisms and their functions.

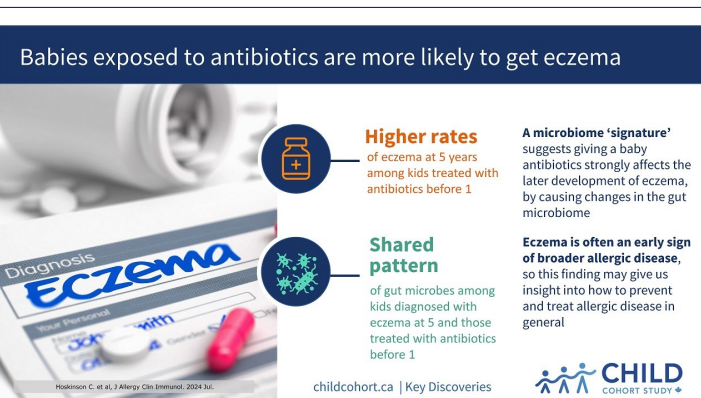
"This shared microbiome 'signature' suggests that using antibiotics before one year has a strong effect on the development of atopic dermatitis, through the changes the antibiotics cause in the one-year gut microbiome," says co-senior author Dr. Turvey.

FIRST YEAR IS FUNDAMENTAL

"Interestingly, antibiotic use after age one did not have the same impact; kids exposed only to antibiotics later in life did not have a significantly different eczema risk compared to kids with no exposure," adds Maria V. Medeleanu.

"These findings again demonstrate how important it is to be careful when it comes to prescribing systemic antibiotics to infants during their first year," notes co-senior author Dr. Subbarao.

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- Higher rates** of eczema at 5 years among kids treated with antibiotics before 1
- Shared pattern** of gut microbes among kids diagnosed with eczema at 5 and those treated with antibiotics before 1

A microbiome 'signature' suggests giving a baby antibiotics strongly affects the later development of eczema, by causing changes in the gut microbiome

Eczema is often an early sign of broader allergic disease, so this finding may give us insight into how to prevent and treat allergic disease in general

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Hoskinson C. et al. J Allergy Clin Immunol. 2024 Jul.