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Think twice before reaching for that plastic water bottle or packing lunch in a convenient container. A new study from the University of Granada has revealed a shocking connection between common household items and children's gut health.

This research sheds light on how a chemical found in many everyday plastics could be silently disrupting the gut bacteria in children, especially those facing the challenge of obesity.

Bisphenol A and gut microbiome

Bisphenol A, commonly abbreviated as BPA, is a widely used chemical found in many everyday items. It's a key ingredient in plastics and resins, making them strong and clear. We encounter BPA in water bottles, food containers, can linings, dental sealants, and even receipts.

However, concerns exist about the safety of BPA. It can mimic the hormone estrogen in our bodies, potentially leading to hormonal imbalances. This has been linked to various health problems, including issues with reproduction, heart, diabetes, and obesity.

As a result, there's a growing effort to find safer alternatives to BPA. While some products now claim to be "BPA-free," it's important to remember that replacements like bisphenol S (BPS) and bisphenol F (BPF) also raise similar health concerns.

Children's gut health

The researchers took samples of gut bacteria from children with different levels of BPA exposure. The findings highlighted two key effects of BPA:

Selection for BPA-resistant species

When exposed to BPA, the gut environment favors the growth and survival of bacteria that can tolerate or break down BPA. This selective pressure leads to an increase in these BPA-resistant bacterial populations, potentially at the expense of other, more sensitive species.

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This shift in the composition of the gut community could have unforeseen consequences for our health like disrupting the balance of beneficial versus harmful bacteria, leading to a weakened immune system, increased susceptibility to infections, and potentially contributing to the development of metabolic disorders such as obesity and diabetes

Impact on microbiota diversity

The presence of BPA not only affects the balance of specific bacteria but also influences the overall diversity of the gut microbiome.

The experts found that some bacterial groups, like Clostridium and Romboutsia, thrived in the presence of BPA, suggesting potential resilience or adaptation to this chemical. Conversely, other beneficial bacterial groups, including Intestinibacter, Escherichia-Shigella, Bifidobacterium, and Lactobacillus, were negatively affected, highlighting their sensitivity.

Resistance to BPA

"We found that the gut microbial community responds differently to BPA exposure depending on the BMI (body-mass index) of the individual," noted study senior author Dr. Margarita Aguilera.

Children with a healthy weight had a stronger and more diverse community of gut bacteria, which helped them resist the negative effects of BPA. This suggests that a healthy gut microbiome can act as a shield against environmental toxins like BPA.

However, children who were heavier had a different reaction. When exposed to BPA, they lost more beneficial bacteria in their gut. The loss of diversity and beneficial bacteria could worsen their weight problems, creating a cycle where BPA exposure makes obesity even harder to manage.

Study significance

The research not only improves our understanding of how the gut microbiome influences health and disease, but it also opens doors for future interventions. Scientists could explore the use of these BPA-degrading microbes to lessen the impact of BPA, particularly regarding obesity.

The study also emphasizes the importance of considering individual differences, such as weight, in how people react to environmental chemicals. This personalized approach could lead to better strategies for preventing and managing obesity, focusing on the gut microbiome's role.

"We want to raise awareness about the health risks associated with microplastics that enter our bodies, and those that circulate in the environment," said Dr. Aguilera. "It's crucial for individuals to be mindful of these concerns."

The study is published in the journal *MSystems*.

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