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Antibiotics affect babies' long-term health

Research in Cork and Canada shows that the bacterial composition in the gut of infants treated with broad-spectrum antibiotics is still altered eight weeks after treatment.

The research, carried out by scientists in the Alimentary Pharmabiotic Centre based in Teagasc, University College Cork, Cork University Maternity Hospital and The Hospital for Sick Children, Toronto, Canada, was published in the journal *Antimicrobial Agents and Chemotherapy*.

In the study, nine infants were treated with intravenous ampicillin/gentamicin within 48 hours of birth, and over the two month study period, their gastrointestinal flora was compared to that in nine infants who received no antibiotics. At four weeks, beneficial bacteria, including Bifidobacteria and Lactobacilli, were significantly reduced in the treated group, and although the numbers bounced back by the study's end, the species diversity did not. The researchers used advanced DNA sequencing to identify the species of gut flora, and to quantify their numbers.

"This is the first sequencing-based study to demonstrate the negative effects of short-term antibiotic treatment on the beneficial gut bacteria populations in infants," says senior author Catherine Stanton of the Alimentary Pharmabiotic Centre based at Teagasc Food Research Centre, Fermoy, Co Cork. "By altering the gut microbiota, and thus the immune system very early in life, the antibiotics could negatively influence long-term health, particularly by increasing the risk of developing asthma, allergy, and obesity. This risk is heightened by the fact that the antibiotic-driven disruption of the microbiota comes at a time when this population is in rapid flux and can easily be unbalanced"

Eight weeks after antibiotic treatment of infants, the diversity of gastrointestinal flora remained diminished, although the number of individual bacteria was back to normal. Additionally, the potentially disease-causing Proteobacteria were now the dominant population in the treated infants.

It remains unclear whether the potentially harmful Proteobacteria predominate because their population has grown or because the other populations have shrunk, the researchers write. However, the data suggest the former, which jibes with previous research.

"This research suggests that the merits of administering broad-spectrum antibiotics - those that kill many bacterial species - in infants should be reassessed, to examine the potential to use more targeted, narrow-spectrum antibiotics, for the shortest period possible," says Stanton.

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