

Antibiotics disrupt gut flora in infants: Recovery still incomplete after 8 weeks

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Eight weeks after antibiotic treatment of infants, the diversity of gastrointestinal flora remained diminished, although the number of individual bacteria was back to normal, according to a paper in the November 2012 issue of the journal *Antimicrobial Agents and Chemotherapy*. Additionally, the potentially disease-causing Proteobacteria were now the dominant population in the treated infants.

"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 coauthor Catherine Stanton of the Teagasc Food Research Centre, Fermoy, Cork, Ireland.

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 were compared to that in nine control infants. At four weeks, bacteria from the beneficial genera, the Bifidobacteria and the Lactobacilli, were significantly reduced, 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, says Stanton.

By altering the gut microbiota, and thus the immune system very early in life, the antibiotics could negatively influence long-term health, particularly by boosting the risk of developing asthma, allergy, and obesity, according to the report. The 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," according to the report.

These results notwithstanding, because the sequencing data reveal only proportions of species present, rather than absolute numbers, 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.

More information: F. Fouhy, C.M. Guinane, S. Hussey, R. Wall, C.A. Ryan, E.M. Dempsey, B. Murphy, R.P. Ross, G.F. Fitzgerald, C. Stanton, and P.D. Cotter, 2012. High-throughput sequencing reveals the incomplete, short-term recovery of infant gut microbiota following parenteral antibiotic treatment with ampicillin and gentamicin. *Antim. Agents Chemother.* 56:5811-5820.

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