

Bacteria overgrowth could be major cause of stunting in children

February 19 2016, by Josh Barney



A small child in a Bangladeshi slum, where sanitation is thought to contribute to excessive bacterial growth in the small intestine, which can lead to an increased risk of stunted growth, cognitive disability and premature death.

Excessive growth of bacteria in the small intestine could be damaging

the guts of young children, leading to stunting, scientists from the U.S. and Bangladesh have discovered.

Globally, 165 million [children](#) are stunted or short for their age, while in Bangladesh – where the researchers have been working – stunting affects 36 percent of children under 5. Being stunted increases the chances of both cognitive disability and death before the age of 5.

One possible factor contributing to stunting is damage to the gut – "environmental enteropathy" – leading to inflammation and poor uptake of dietary nutrients. The origins of environmental enteropathy are not clear, but excessive numbers of bacteria in the [small intestine](#), referred to as small intestine bacterial overgrowth, or SIBO, have been suggested as one possible cause.

To explore this idea, the researchers examined 103 2-year-old children who had been followed from birth in an urban slum in Mirpur, Dhaka. Despite vaccination, medical care, nutritional counseling and care, stunting increased in these infants from 9.5 percent at birth to 27.6 percent at 1 year of age.

Notably, one in six 2-year-old children tested showed signs of SIBO, as revealed by the presence of hydrogen in their breath, a result of bacterial metabolism of sugar to hydrogen in the small intestine. Importantly, bacterial overgrowth was more common in children showing stunted growth and was associated with gut inflammation.



Dr. Jeff Donowitz, left, with colleagues in Bangladesh.

"We knew that the children's intestines were being damaged and that was associated with malnutrition, so we decided to test to see if this damage could be due in part to bacteria in their small intestine," said Dr. Jeff Donowitz, lead author on the study. Donowitz is a pediatric infectious disease specialist at Virginia Commonwealth University and an infectious disease fellow at the University of Virginia School of Medicine.

"One of the things we are working on now is to see when small intestine bacterial overgrowth occurs as children grow up in urban slums and understand its contribution," Donowitz added. "We suspect that SIBO at

an early age leads to malnourishment."

By understanding what causes malnourishment, the international team of physicians and scientists hopes that it will become possible to treat and prevent it.

Commenting on the study, Dr. Tahmeed Ahmed, senior director of the nutrition and clinical services division at icddr,b – an international public health research institution in Bangladesh – said, "The findings certainly provide fresh knowledge about gut damage. However, it is important to know to what extent small intestine bacterial overgrowth is associated with stunting in order to identify ways to treat gut bacterial overgrowth and tackle stunting among children."

Dr. Rashidul Haque, co-author of the study and senior scientist, enteric and respiratory infections at icddr,b, said, "The study findings highlighted that growth faltering and poor sanitation are associated with SIBO. Discovering that SIBO was common and associated with intestinal damage highlighted to me the promise of treatment for SIBO to improve malnutrition therapies."

The findings have been published in the journal *mBio*.

Provided by University of Virginia

Citation: Bacteria overgrowth could be major cause of stunting in children (2016, February 19) retrieved 3 May 2024 from

<https://medicalxpress.com/news/2016-02-bacteria-overgrowth-major-stunting-children.html>

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