MedicalXpress

Good bacteria may expunge vancomycin-resistant bacteria from your gut

February 27 2013

Too much antibiotic can decimate the normal intestinal microbiota, which may never recover its former diversity. That, in turn, renders the GI tract vulnerable to being colonized by pathogens. Now researchers from Memorial Sloan-Kettering Cancer Center, New York, NY, and Centro Superior de Investigación en Salud Pública, Valencia, Spain, show that reintroducing normal microbial diversity largely eliminated vancomycin-resistant enterococci (VRE) from the intestinal tracts of mice. The investigators showed further that the findings may apply to humans. The research is published in the March 2013 issue of the journal *Infection and Immunity*.

The reduced diversity of microbiota wrought by antibiotics "allow[s] VRE to invade and thrive in the intestine, suggesting that bacterial species that are wiped out by antibiotics are key to preventing colonization by VRE," says first author Carles Ubeda of the Centro Superior de Investigacion en Salud Publica, Valencia, Spain. "We hypothesized that repopulating the mice' intestines with the missing bacteria would promote clearance of the VRE."

In the study, the researchers treated mice with antibiotics. They then gave the mice fecal transplants from untreated mice, or aerobic or anaerobic cultures from the fecal transplants. Following the latter treatments, mice receiving the fecal transplant or the anaerobic culture were able to clear the VRE, while those receiving the aerobic culture failed to do so. The researchers compared the microbiota in each group. The big difference: the mice that had cleared the VRE contained

bacteria from the anaerobic genus, *Barnesiella*, while those that had failed to clear the VRE did not.

The researchers then analyzed the fecal microbiota from human patients who had received bone marrow transplants, who were at high risk of being colonized by vancomycin-resistant enterococci. "The presence of *Barnesiella* in fecal samples was associated with protection against VRE, suggesting that in humans, *Barnesiella* may also confer protection against dense VRE colonization," says Ubeda.

"The findings could be very useful for development of novel probiotics," says Ubeda. Additionally, "scientifically, this is a major finding that will help us to understand how the microbiota confer resistance against intestinal colonization by pathogens, an important question that remains incompletely answered."

More information: C. Ubeda, V. Bucci, S. Caballero, et al. Intestinal microbiota containing Barnesiella species cures vancomycin-resistant Enterococcus faecium colonization. *Infect. Immun.* 81:965-973

Provided by American Society for Microbiology