Fecal Transplants Beat Antibiotics In Treating A Lethal Form of Diarrhea

By Weston Bettner — June 18, 2018

There is an arms race apace, a war of attrition between humans and bacteria that has lasted millennia. However, with the discovery of penicillin in 1928 the scale was tipped. Pneumonia, tuberculosis, and diarrhea – the 3 leading causes of U.S. deaths in 1900 – were greatly reduced. We were winning.

But the story did not end. Indiscriminate antibiotic use coupled with microbial ingenuity ushered in a major setback – drug resistance. Bacteria treated with an antibiotic eventually developed gene mutations, rendering them impervious to that drug; bacteria exchanged/traded these genes like playing cards, creating multi-drug resistant organisms, so-called “superbugs.”

Clostridium difficile, is one of those superbugs. According to CDC data from 2015, approximately 453,000 cases of diarrhea and 29,000 deaths in the U.S. can be attributed annually to Clostridium difficile infection (CDI). CDI has become the most common healthcare-associated infection in the United States; and a hypervirulent strain (C. difficile 027/BI/NAP1) emerged in the early 2000s, resulting in even more morbidity, mortality, and costs.

While treatment of an initial bout of CDI with antibiotics [1] is often successful, it is frequently transient, with 16-35% of patients developing a recurrent infection within 8 weeks. For those with recurrence, the “gift” frequently keeps giving with further episodes. In some instances, the recurrence rate is 50 to 60%. In the genesis of superbugs, antibiotic resistance is only one piece of the puzzle. Recurrence may be driven by alterations in the “normal gut flora,” the microbiome, rather than by drug resistance as resistance to oral vancomycin/fidaxomicin is rare. Unfortunately, the use of antibiotics alters the microbiome, killing the good bacteria, and providing a breeding ground for harmful ones.

Fecal transplantation

Fortunately, there is a relative newcomer to the game – fecal microbiota transplants. The concept is simple -- replenish the good bacteria and control the disease-causing bacteria. While not formally approved by the FDA, fecal transplants have been incorporated into consensus guidelines for “people with two or more recurrences of CDI and for whom traditional antibiotic treatment has not worked.”

The process, performed at a select number of centers, involves the transfer of fecal bacteria from a healthy person’s stool to the gut of a person with recurrent CDI often via a colonoscopy (the same procedure used to screen for colon polyps). To date, results have been far superior with fecal transplant as compared to antibiotic therapy, with resolution rates exceeding 80%.
While it is early, the next inflection point in the human vs. bacteria arms race may center on the microbiome, with fecal transplants serving as the ‘new antibiotic.’

[1] Specific guidelines [1] were published this year favoring oral vancomycin or fidaxomicin.

References:

New C diff guidelines incorporate fecal transplant [2]

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