

Friendly Bacteria

Probiotics, which once were viewed as nothing more than snake oil, are now being studied as treatments for a variety of digestive disorders.

We wash our hands, brush our teeth, and scrub our countertops to get rid of germs, so the idea of deliberately swallowing hundreds of millions of live bacteria may seem counterintuitive—even revolting. But evidence is accumulating that “friendly” bacteria called probiotics can safely treat a variety of digestive disorders.

So far, the best evidence for probiotics (from the Latin and Greek, meaning “for life”) exists for treating infectious diarrhea in children, antibiotic-associated diarrhea, and pouchitis, a condition that often affects people with ulcerative colitis who have undergone surgical resection of the colon.

Probiotics are also promising for irritable bowel syndrome (IBS), ulcerative colitis, and Crohn’s disease and for prevention of bacterial infections after surgery.

Intestinal Flora

The digestive tract plays host to hundreds of types of bacteria and other microorganisms, which are termed flora. Although some of these organisms can cause disease, most perform valuable functions. For instance,

beneficial bacteria in the digestive tract produce substances, such as lactic acid and hydrogen peroxide, that inhibit the growth of harmful bacteria and fungi. These bacteria also compete with disease-causing microbes for nutrients and space, thus hindering overgrowth of the bad bugs. Beneficial organisms also secrete enzymes that aid digestion.

At present, the best-studied probiotics are *Lactobacillus* and *Bifidobacterium*, which are termed lactic acid bacteria because they use sugar as a food source and generate lactic acid in return. These same microbes are used to convert milk into cheese and yogurt. Other beneficial bacteria include the yeast *Saccharomyces boulardii* and a harmless form of the common intestinal bacterium *Escherichia coli*. In the past few years, scientists have also been investigating the effects of food ingredients called prebiotics, nondigestible carbohydrates that foster the growth of specific organisms already present in the intestine.

Encouraging Studies

Although probiotics are being tested

for uses ranging from enhancing immunity to protecting against cavities, gastrointestinal problems are likely to be the first disorders addressed with probiotic therapy.

Infectious diarrhea. Some of the most compelling evidence for the effectiveness of probiotics comes from studies of children with severe diarrhea. Several trials have shown that probiotic therapy can significantly reduce the duration of rotavirus infection, the most common cause of diarrhea in infants and children. And a large multicenter European trial, published in 2000 in the *Journal of Pediatric Gastroenterology and Nutrition*, showed that adding the probiotic *Lactobacillus GG* to an oral rehydration solution shortened the duration of severe diarrhea in children.

Antibiotic-associated diarrhea. There is also reasonably convincing evidence that taking a probiotic during antibiotic therapy can help prevent antibiotic-associated diarrhea. A review article published in 2003 concluded that *Saccharomyces boulardii* is an effective treatment; some evidence also exists for *Lactobacillus GG*.

severe pain, fever, nausea, and vomiting. The pain is located below the bottom edge of the right rib cage and often radiates to the back, right shoulder, or right side of the neck.

When stones migrate from the gallbladder into the common bile duct, they cause partial or complete obstruction of bile flow. Signs and symptoms of bile duct obstruction include intermittent abdominal pain, jaundice (yellow discoloration of the skin and eyes), and cholangitis (inflammation of the bile ducts). Gallstones impacted in the major duodenal papilla can cause acute pancreatitis (inflammation of the pancreas) with abdominal pain, nausea, and vomiting.

Diagnosis. Multiple tests are currently available to evaluate peo-

Pouchitis. Several small, placebo-controlled studies have concurred that VSL#3 is effective in reducing the risk of relapse in chronic pouchitis. VSL#3 is a combination of eight probiotics, including several strains of *Lactobacillus* and *Bifidobacterium*.

Irritable bowel syndrome. A randomized, placebo-controlled trial by Mayo Clinic researchers published in 2003 in *Alimentary Pharmacology & Therapeutics* determined that eight weeks of therapy with VSL#3 significantly reduced abdominal bloating in people with diarrhea-predominant IBS.

And in a study of 44 people with IBS presented at Digestive Disease Week in 2003, the probiotics *Lactobacillus acidophilus* and *Bifidobacterium infantis* were as effective in improving symptoms and quality of life on their own as when combined with antibiotics.

Ulcerative colitis and Crohn's disease. Two controlled trials have found that the probiotic *E. coli* achieved results comparable to those of mesalamine (Asacol, Pentasa, Rowasa), a standard drug used to treat ulcerative colitis. Probiotics' possible role in managing Crohn's disease is still unclear, but human trials are under way.

How Do You Take Probiotics?

If you want to try probiotic supplements for a few weeks to see if they help with your gastrointestinal symptoms, check with your doctor first. A variety of capsules, liquids, and powders are available. Powders can be stirred into food but shouldn't be added to food warmer than room temperature because heat will kill the bacteria.

Another option is to add probiotic-containing foods to your diet. These foods include yogurt, kefir (a cultured-milk beverage), tempeh (which is made from soybeans), and kimchi (a Korean fermented cabbage dish). It is unclear whether they contain enough probiotics to have any effect, however.

Prevention of bacterial infections after surgery. In a 2002 trial of 95 people undergoing liver, stomach, or pancreas surgery, people randomized to receive live *Lactobacillus plantarum* were less likely to develop bacterial infections than those who did not receive it or who received heat-killed *Lactobacillus plantarum*.

Any Drawbacks?

Because probiotics do not permanently colonize the gastrointestinal tract, they would probably need to be taken indefinitely to maintain any beneficial effects. Although there is a small chance that they could cause an infection, especially in people at high risk for opportunistic infections or in cases where the gastrointestinal tract is badly damaged, the probiotic

strains that have been tested appear to be very safe. Other problems include difficulties in determining the dose and the need to standardize different types of probiotics.

However, more research is needed to identify the best probiotic—and the optimal dose—for managing a particular condition. And many experts believe that better regulation of probiotics is needed to ensure that the over-the-counter products now widely available contain viable microorganisms in the amounts stated. A recent Canadian study of 10 commercial probiotic formulas found that 2 contained no viable organisms, and that the remaining 8 contained only 10% of the number stated on the label.

ple with suspected gallstones. The best way to diagnose stones inside the gallbladder is with abdominal ultrasound, performed by placing an acoustic probe on the abdominal wall. This noninvasive, totally painless test requires no special preparation aside from fasting for six to eight hours. More than 95% of the time, abdominal ultrasound is able to detect gallbladder stones larger than 2 mm. In people with acute cholecystitis, ultrasound can detect thickening of the gallbladder wall as well as the presence of inflammatory fluid in and around the gallbladder. Abdominal ultrasound is unable to visualize stones in the bile ducts but can accurately document dilation of the common bile duct due to obstruction.

Endoscopic ultrasound, performed using a special endoscope