Prebiotics and probiotics may offer benefits to the body’s natural immune defense mechanisms. It has been recognized that certain naturally occurring bacteria in the gut might be beneficial to overall health. Early in the 1900s, when Nobel laureate Dr. Elie Metchnikoff reported that peasants who consumed sour milk with live Lactobacillus bulgaricus lived longer than others, it became clear that probiotics, or “prebiotics,” can prevent or reduce diarrhea caused by altered gut flora from antibiotics or rotavirus. In addition, “prebiotics,” the nondigestible oligosaccharides that stimulate the growth of existing probiotic bacteria, also have drawn interest. Prebiotic supplements that do not contain added probiotics could avoid some of the problems associated with probiotics, such as difficulty maintaining live organisms until administration and potential bacteremia in immunosuppressed individuals.

Present in breast milk, prebiotics enhance the growth of existing probiotic bacteria strains Bifidobacteria and Lactobacillus, which predominate in the guts of breast-fed infants. The gut flora of bottle-fed infants, in contrast, tend to comprise primarily Enterobacteriacea and Clostridia. Several studies—some supported by infant formula manufacturers—show that adding probiotic galacto-oligosaccharides and fructo-oligosaccharides to cow’s milk formula can result in intestinal flora in bottle-fed infants similar to that in breast-fed infants. This, in turn, results in a reduced intestinal load of more pathogenic bacteria in the infant.

Mucosal and systemic immunity also appear to be enhanced with prebiotic supplementation, possibly reducing subsequent immune-mediated disease such as asthma and allergies. In one prospective, placebo-controlled study, 102 infants at high risk for atopy were fed prebiotic-containing formula (galacto- and long-chain fructo-oligosaccharides) or formula with a placebo (maltodextrin). The atopic dermatitis rate was 9.8% for infants receiving probiotics, compared with 23.1% for placebo (Arch. Dis. Child. 2006;91:814-9).

A growing data set suggests that pre- and probiotic supplementation in infants can enhance IgA responses to antigenic challenge, and favorably influence T-helper cell balance, thus reducing inflammatory and/or allergic responses. One prebiotic, lactulose, is commercially available in liquid form under various brand names and is approved for treating constipation.

Whether to routinely prescribe lactulose or other prebiotics for non-breast-fed infants remains an unanswered question. Stay tuned for more data.

Meantime, I believe the data on probiotics are sufficient to support several clinical uses. I advise using a product containing Lactinex, which contains both Lactobacillus acidophilus and Lactobacillus bulgaricus, for non–breast-fed infants. The product provides prolonged antimicrobial therapy, particularly with broad-spectrum agents. I also recommend it during shorter antibiotic courses if mom says that her child always develops diarrhea while on antibiotics.

Lactinex comes in tablet or packet form, with 1 million colony-forming units per tablet or 100 million per packet. The granules can be mixed with food or formula. I advise one packet per day for all ages. Older children can take two to three tablets, three to four times a day.

In the 1990s, my colleagues and I conducted a study in children on a broad-spectrum antibiotic where a 30% reduction in daily stool number and 30% fewer diarrhea days occurred with Lactinex, compared with placebo supplements. The study, funded by an antibiotic manufacturer, was not published because of higher-than-expected diarrhea rates in control arms. But, it encouraged me about the potential benefit of probiotics.

Another option for acute diarrhea is Lactobacillus GG, a widely studied probiotic strain sold commercially under the brand name Culturelle. A 2001 literature review revealed that probiotics significantly lowered the risk (odds ratio 0.43) of diarrhea lasting more than 3 days, particularly with rotavirus. Of individual strains, only Lactobacillus GG showed consistent effect (J. Pediatr. Gastroenterol. Nutr. 2001;33 suppl. 2:S17-25).

But other data suggest benefit for other probiotic organisms. A randomized study of 201 healthy, non–breast-fed day care infants aged 4-10 months compared Lactobacillus reuteri or Bifidobacterium lactis with placebo, revealing significantly fewer episodes of fever (11%, 27%, and 41%, respectively) and diarrhea (13%, 23%, 31%). Duration of diarrhea was also shorter with the probiotics (Pediatrics 2005;115:5-9).


To be sure, not all pre- and probiotic studies have had positive outcomes. But, excluding immunosuppressed individuals, risk is minimal from these naturally occurring organisms, so why not use them? I predict that we’ll be hearing more about this in the future.

Dr. Harrison is professor of pediatrics and pediatric infectious diseases at Children’s Mercy Hospitals and Clinics, Kansas City, Mo. He has no conflict of interest with any of the manufacturers mentioned in this column.

Fluconazole Prophylaxis in NICU Not Linked to Resistance

By Christopher J. Harrison, M.D.

Toronto — Fluconazole prophylaxis for invasive candidiasis in extremely low-birth-weight infants is not associated with the emergence of fluconazole-resistant Candida species, Dr. C. Mary Healy said at the annual meeting of the Infectious Diseases Society of America.

In infants weighing less than 1,000 g at birth, 42 days of fluconazole prophylaxis (FP) has been shown to reduce Candida coloinvasion and invasive candidiasis, “but the possibility that [this regimen] could lead to a resistant Candida species is an ongoing concern,” said Dr. Healy of Baylor College of Medicine in Houston. “The worry is that FP will cause overgrowth and infection by inherently less susceptible species, particularly C. glabrata.”

To evaluate the impact of FP on the incidence of invasive candidiasis (IC), as well as IC rate by enhancing the body’s natural immune defense mechanisms. Recognition that certain naturally occurring bacteria in the gut might be beneficial to overall health. Early in the 1900s, when Nobel laureate Dr. Elie Metchnikoff reported that peasants who consumed sour milk with live Lactobacillus bulgaricus lived longer than other people, now emerging data suggest that supplementing associated bacteria, also known as “prebiotics,” can prevent or reduce diarrhea caused by altered gut flora from antibiotics or rotavirus. In addition, “prebiotics,” the nondigestible oligosaccharides that stimulate the growth of existing probiotic bacteria, also have drawn interest. Prebiotic supplements that do not contain added probiotics could avoid some of the problems associated with probiotics, such as difficulty maintaininglive organisms until administration and potential bacteremia in immunosuppressed individuals. Present in breast milk, prebiotics enhance the growth of existing probiotic bacteria strains Bifidobacteria and Lactobacillus, which predominate in the guts of breast-fed infants. The gut flora of bottle-fed infants, in contrast, tend to comprise primarily Enterobacteriacea and Clostridia. Several studies—some supported by infant formula manufacturers—show that adding probiotic galacto-oligosaccharides and fructo-oligosaccharides to cow’s milk formula can result in intestinal flora in bottle-fed infants similar to that in breast-fed infants. This, in turn, results in a reduced intestinal load of more pathogenic bacteria in the infant. Mucosal and systemic immunity also appear to be enhanced with prebiotic supplementation, possibly reducing subsequent immune-mediated disease such as asthma and allergies. In one prospective, placebo-controlled study, 102 infants at high risk for atopy were fed prebiotic-containing formula (galacto- and long-chain fructo-oligosaccharides) or formula with a placebo (maltodextrin). The atopic dermatitis rate was 9.8% for infants receiving probiotics, compared with 23.1% for placebo (Arch. Dis. Child. 2006;91:814-9).

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