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What GI Physicians Need to Know About Probiotics

WHAT GIs NEED TO KNOW ABOUT PROBIOTICS?

You are listening to ReachMD, The Channel for Medical Professionals. Welcome to GI Insights. We will recover the latest clinical issues, trends, and technologies in gastroenterological practice. GI Insights is brought to you by AGA Institute and sponsored by Takeda Pharmaceuticals, North America. Your host for GI Insights is professor of medicine at University of Illinois, Chicago, Dr. Jay Goldstein.

Probiotics are you pick what is grocery store rails and they are found everywhere from teas to cereals to other products, but are they really beneficial as many claim they are. Joining us to discuss what GIs need to know about probiotics is Dr. Richard Fedorak, professor of medicine in the division of gastroenterology and chair of the center of excellence for gastrointestinal inflammation and immunity research at the University of Alberta in Canada.

DR. JAY GOLDSTEIN:

Welcome Dr. Fedorak.

DR. RICHARD FEDORAK:

Thank you Jay.

DR. JAY GOLDSTEIN:

We had to be have you here, I really want to know what are probiotics and how do they differ? It takes me back to my days in medical school where we haven't learned microbiology.

DR. RICHARD FEDORAK:

Good question Jay. So, probiotics are really those living organisms that scientific research has demonstrated are a benefit to our health. For the most part, one can think of good bacteria and bad bacteria. These are the good bacteria that deliver some benefit to the human that take some.

DR. JAY GOLDSTEIN:

So that by definition, they are good bacteria?

DR. RICHARD FEDORAK:

Correct.

DR. JAY GOLDSTEIN:

And we only know that they are probiotics after they have been studied.

DR. RICHARD FEDORAK:

Well, yes. The common probiotics are lactobacillus, bifidobacterium and they are falling into 2 categories. Those probiotics that we use in food all the time such as when we are making yogurt and fermented milks and more recently, though science has been identifying probiotics, they can perhaps be used to treat certain diseases, but again it's many of the same bacteria in those lactobacillus groups, the bifidobacterium groups.

DR. JAY GOLDSTEIN:

What makes them good? How do they work?

DR. RICHARD FEDORAK:

Scientists are working hard on distinguishing what probiotics do inside your intestine and the specific mechanisms around their effects, but let me give you few examples. For instance, some probiotics are really antisecretory. They can actually cause the gut to slow down water secretion in the presence of enteropathogenic bacteria. Many of these probiotics up regulate mucus secretion, so the mucus lining of the gut becomes thicker and almost access a barrier to bad bacteria. Other probiotics stimulate the immune system. So, they stimulate secretion of secretary IgA which is beneficial. They also up regulate the mucosal immune system making it less inflammatory and more anti-inflammatory. So, those who are an example of some of the mechanisms that these probiotics have and you can see that by these different mechanisms, they can be applied to treat different types of diseases.

DR. JAY GOLDSTEIN:

Let's pick up one. What you think is the best example, no go to others, but what you think is the best example where probiotics play a major role in the management of the disease state?

DR. RICHARD FEDORAK:

Currently, the most work in the area of the more scientific work has been done in the realm of inflammatory bowel disease, particularly in the realm of pouchitis, so patients who have had a colectomy and now have an ileal anal pouch made and that pouch gets inflamed and also an ulcerative colitis. Now, let me tell you little bit about the pouchitis. So, pouchitis for doctors can be difficult to treat patients, get a lot of urgency and diarrhea. We have been using antibiotics and the antibiotics for the most part are pretty effective and once we treated them with antibiotics, we would stop the antibiotics, but the pouchitis would come back. We have now level 1, so the best possible evidence in at least 3 different randomized control trials in 2 different countries that providing a probiotic after you have treated with an antibiotic to get the pouchitis under control, now using the probiotic to maintain the pouch in good health, it has been effective in between 80 to 90% of those patients. Those are percentages we have never seen before and so, here is the perfect instance where a probiotic can be used as maintenance therapy to prevent pouchitis from recurring.

DR. JAY GOLDSTEIN:

Why do you think its working?

DR. RICHARD FEDORAK:

Well, probiotics work through a number of those mechanisms we have talked about, but things like pouchitis probably have a major bacterial role as their cause and so, you can imagine that taking this probiotic is now changing the bacteria in that pouch from a more injurious bacterial load to a less injurious bacterial load with these probiotics. Perhaps those probiotics are also affecting the mucosal immune system in that pouch making it less inflammatory.

DR. JAY GOLDSTEIN:

Do we require continuous therapy?

DR. RICHARD FEDORAK:

Yes. When you start taking a probiotic, it takes 7 to 14 days for you to colonize your gut and then you only colonize with the probiotic as long as you are taking it. Once you stop it, the probiotics go out of your system. If you are using probiotics as a therapy, you will need to take them forever.

DR. JAY GOLDSTEIN:

Assuming they work?

DR. RICHARD FEDORAK:

Assuming they work, correct.

DR. JAY GOLDSTEIN:

All right. I have really liked your example in the pouchitis and in ulcerative colitis, but won't you go on and then tell us a little bit more about some or the other states. I understand people are using it for, well; I have used it for IBS, so tell me why?

DR. RICHARD FEDORAK:

Well, again, people are looking at probiotics to see whether changing the bacterial flora of the gut can improve some of their symptoms. Now, there is lots of research being done around irritable bowel syndrome and the fact that perhaps some bacterial overgrowth in that gut is playing a role, perhaps a way bacteria are growing in the small and large intestine is actually damaging the nerves about small and large intestine, changing motility. Well, people are looking at adding probiotics to patients with irritable bowel syndrome and seeing whether you can improve the symptoms. The studies are not as robust as inflammatory bowel disease, but these pilot studies that are suggesting some benefits. Let me give you another example, Clostridium difficile, antibiotic-associated diarrhea. You get Clostridium difficile and all of us are treating that infection with metronidazole or vancomycin and we are managing that infection, but we know that 30% of those patients will get it recurred. Treatment with probiotics, particularly relative to Clostridium difficile treatment with Saccharomyces boulardii, so this is a probiotic yeast now prevents that recurrence. You know, where half of the patients, so there is the again an example and 2 randomized control trials where Saccharomyces boulardii is effective in treating recurrent Clostridium difficile associated diarrhea.

DR. JAY GOLDSTEIN:

If you are just tuning in, you are listening to GI insights on ReachMD, the Channel for Medical Professionals. I am your host, Dr. Jay Goldstein and joining me today to discuss what GIs need to know about probiotics is Dr. Richard Fedorak, professor of medicine in the division of gastroenterology and chair for the center of excellence for gastrointestinal inflammation and immunity research at the University of Alberta in Canada.

Well, let's pick up on this concept that there are multiple different probiotics and there are many disease states. I would like to focus in on irritable bowel syndrome, if we have mixed types, constipation predominant and diarrhea predominant. Based on mechanism of action, can we be more predictive of which probiotic is going to be beneficial to an individual patient?

DR. RICHARD FEDORAK:

So, Jay, that is the immediate future, as scientists are now dissecting away the mechanism of action of individual probiotics species. We have learned that perhaps Lactobacillus is different than Saccharomyces boulardii is different than Bifidobacterium. We need to now move to the next phase, which you have just eluded to we are not there yet, but we need to be able to apply a mechanism of action to the disease. So, let me give you an example, if you have diarrhea-predominant irritable bowel syndrome, perhaps you want to use a probiotic that has a dominant antisecretory reaction.

DR. JAY GOLDSTEIN:

That’s face validity.

DR. RICHARD FEDORAK:

Exactly. And if you have irritable bowel syndrome that is constipation dominant, you will want a probiotics that perhaps alters intestinal

motility or changes the mucus complexity of the guts, so that there is more mucus, a looser bowel motion, but we are not there yet, but within the next several years, we should be able to match mechanism of action with diseases and then I think you really see surgeons the use of probiotics to treat diseases.

DR. JAY GOLDSTEIN:

I look forward to that. Moving on though, my patients who want a natural cure for their disease state and they say rather than medications, I would take probiotics because they are safer. Is that a true statement?

DR. RICHARD FEDORAK:

I think it is. Most patients, doctors recognize the probiotics have been around for a long, long time. We have been using probiotics in fermented milks and in food, then in yogurts forever. And these are safe bacteria. What we are doing now is a bit of a change. We are using many more of those bacteria, so in greater quantities to treat diseases and so the question is, are they safe when used in these large quantities? The answer is for the most part, as far as we can determine for all the probiotics be tested, they are safe. We have not seen any increase in infections. We are using these probiotics in patients who are immuno compromised like inflammatory bowel disease, safe; we are using them in the intensive care units, safe. So, in situations where you would have expected a complication from the probiotics that is the probiotics to get into the blood stream and cause bacteremia or septicemia, we are not seeing that, so we believe they are safe in all of these types of diseases.

DR. JAY GOLDSTEIN:

What about in children?

DR. RICHARD FEDORAK:

Well, interestingly, there had been case reports both in adults and in children, particularly immuno-compromised children of lactobacillus and bifidobacterium bacteria causing bacteremia in these young children. The reasons for that are not clear that may be related to a less matured gut, differences in intestinal permeability, but those case reports are extremely rare and so as in all of medicine, it's risk, benefit ratio, and the benefits of probiotics if used following best evidence far outweigh any safety concerns or adverse events.

DR. JAY GOLDSTEIN:

Well, that is fascinating. I think we could probably spend hours and hours talking about this, but I think we need to wrap up.

I would like to thank my guest from the University of Alberta in Canada, Dr. Richard Fedorak. Dr. Fedorak, thank you very much for being our guest on this week's GI Insights.

DR. RICHARD FEDORAK:

Jay, thank you very much.

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