Gut Pathology - Part Six

The symptoms of disrupted gut microbiome and fungal overgrowth, which I see as kind of a subcategory of dysbiosis, that's maybe an important distinction because fungi, like candida, are not external exogenous pathogens, they're commensals that can become overgrown when we have dysbiosis. So, the symptoms of this range from obvious things like gastrointestinal discomfort to less obvious symptoms like depression, anxiety, brain fog, ADHD, autism spectrum disorder, skin disease, neurological problems, et cetera. We've already covered some of the mechanisms that would explain this, but in short, disrupted gut microbiota can lead to production of compounds that have a neurotoxic effect, can lead to inflammatory cytokine production, which can suppress activity of the frontal cortex and cause all kinds of other problems. And we're still learning about the mechanisms that explain these associations.

In terms of diagnosis, fungal overgrowth will turn up on stool tests, and there are also some markers for it on urine organic acids tests, like d-arabinitol. I will say that currently I trust the stool markers for fungal overgrowth more than urine markers, depending on the marker. Dysbiosis or disrupted gut microbiome can be detected in stool tests like doctor's data comprehensive stool analysis with proteanomic stool analysis. It can quantify some species of beneficial bacteria and can be helpful in a rough way. And we have tests like American Gut and uBiome, I'll talk about these in a little more detail later, but in short, we still have a lot to learn about their clinical relevance, and some of what we thought we knew turned out to be wrong, so at this point I'm not really recommending these for use in clinical practice, with a few exceptions that we'll discuss later.

Next pathology that I want to talk about that we'll be covering is food intolerance. In many cases, food intolerances are a consequence of other pathologies, such as disrupted gut microbiome or SIBO or intestinal permeability or things like parasites. But of course, it can also be a cause of some of these things, like intestinal permeability. I've listed them as a specific pathology because once they're present they can cause a lot of problems and need to be addressed independently of all of these pathologies, or after those pathologies have been addressed if they still persist. Gluten, of course, is one of the most commonly discussed examples. Celiac disease used to be fatal, before we knew that wheat gluten was what caused celiac, it was often fatal in kids. And non-celiac gluten sensitivity, even though it's typically looked at as being less serious than celiac disease, can have very serious complications including ataxia, which is a form of paralysis, and other neurological problems. Other food intolerances, like to dairy products for example, may not be as severe as gluten intolerance, but they can cause chronic low-grade inflammation, intestinal permeability, which can then lead to antibody production to everything from the joints to the myelin sheath in the brain, and certainly over time can lead to some very serious pathologies and disease. So, we're going to talk more, a lot about diagnosis and treatment of these in the next section of the presentation.

Next pathology is intestinal permeability, currently and formerly known as leaky gut. As we discussed in the physiology section, one of the main functions of the gut is to serve as a barrier system. Most of the time, this works well, but several aspects of the modern lifestyle cause it to

malfunction. These factors lead to abnormalities in the GI tract, compromise the integrity of the gut barrier, increase the entry of undigested antigens into the submucosa and circulation, and then they challenge the immune system that way. So reaction to these antigens is what activates immune and inflammatory cascades, and that results in the production of pro-inflammatory cytokines and a whole array of antibodies, which further contributes to increased intestinal barrier permeability, so again we have another classic vicious cycle.

Dr. Alessio Fasano is a pioneer in celiac and non-celiac gluten sensitivity research. He was actually the first person to discover zonulin, which is a protein that regulates tight junction permeability in the gut, and he believes that leaky gut is actually a precondition to developing autoimmunity along with genetic vulnerability and environmental triggers. He's argued that increased permeability of the intestinal barrier to macromolecules is associated with a whole range, again, of local and systemic inflammatory conditions, including of course celiac and non-celiac gluten sensitivity, food intolerances, IBD, numerous autoimmune diseases, neurological conditions like MS, cognitive dysfunction, behavioral disorders, skin conditions, and new connections that we're discovering, again, on a nearly monthly basis. I have a podcast interview of Dr. Fasano, who was gracious enough to join me as a guest on my podcast a few years back; it was one of the most popular shows I've ever done. He's a really charismatic guy and brilliant researcher, so make sure to listen to that if you haven't already. We'll put a link in the resources section.