ANXIETY AND DEPRESSION: INFLAMMATION STRIKES AGAIN

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We all get anxious or depressed every once in a while and that's normal. But when these emotions become frequent and significantly impact our life, a diagnosis of Generalized Anxiety Disorder or Major Depressive Disorder could be the next step. These conditions have strict criteria and are thought to result from a complex mechanism involving the abnormal regulation of neurotransmitters. Many anti-anxiety and antidepressant medications affect the levels of neurotransmitters in hopes of improving a person's symptoms. However, treating a disease with medications does little to address the root cause of an illness. This is again where functional medicine comes in. This is not to say that psychiatric medications or medications in general are not useful, but they should be coupled with an active search for the root cause of disease.

One of the drivers of many psychiatric conditions that is getting more and more attention is a culprit that you may be familiar with: inflammation. Driven by the immune system, inflammation helps to fight off infections, heal injuries and respond to stress. However, when inflammation is chronically in overdrive, it's a recipe for disaster, and the research is showing that anxiety and depression may be a downstream effect. Now you may be wondering how inflammation and psychiatric illness are connected. You guessed it! The gut is a key factor.

The Gut-Brain Axis

The connection between the gut and the brain is now well-established in the scientific literature, and with hundreds of millions of neurons, the gut has even been called the second brain. A direct link from the gut to the brain exists via the vagus nerve, and our gut bacteria (the microbiome) can have a profound influence on brain health.

A common saying in functional medicine is "fire in the gut, fire in the brain." In other words, inflammation in the gut can lead to inflammation in the brain. Gut inflammation decreases the body's ability to keep harmful bacterial substances out of the circulation that sits right next to the intestinal tract. As these bacterial molecules float through the blood stream they trigger inflammation which can have negative effects on the brain and can potentially cause depressive symptoms (more on this later). It's no surprise then that some antidepressant medications exert some of their effect by suppressing inflammation.

Research tells us that the kinds of bacteria that make up the gut microbiome may also have a significant effect on anxiety and depression. In a study done with rats, the administration of a bacteria called Bifidobacterium infantis led to improvement in depressive behaviors. Furthermore, in a 2011 randomized placebo-controlled study in humans the consumption of probiotics was associated with decreased psychological stress levels and decreased levels of the stress hormone, cortisol.

Beyond inflammation in the gut, which can have many causes from dysbiosis to small intestinal bacterial overgrowth, another source of inflammation is something that we experience every day: stress.

Chronic stress and depression: inflammation as a possible link

It's well known that stress, particularly the stress of significant life events such as losing a loved one, can lead to anxiety and depression. It's also common knowledge that short-term

stress is a good thing given that it forces our body and mind to grow and adapt. However, when stress becomes chronic, disease may follow. The explanation many have proposed stems from the experience of our ancestors.

During human evolution the stresses of life where profound. If we didn't find food, we'd starve. If we were injured, even with a minor injury, it could be a matter of life and death. Our bodies therefore adapted and developed systems to increase our chances of survival. As our species has rapidly modernized, our minds haven't had the chance to catch up. We're not able to differentiate between the life-and-death threat of a predator lurking in the bushes and the nuisance of rush-hour traffic. Furthermore, the frequency of the stress we experience in today's age is alarming. Our bodies never evolved to function optimally in a state of constant "fight or flight."

Nevertheless, the "fight or flight" state has tremendous advantages. It activates our body's immune system and helps us heal wounds and fight potential infections should they occur.

Interestingly, even social stressors – such as rejection, loneliness, or conflict - can activate the immune system. These social stressors can provide a chronic source of inflammation, increasing our risk of diseases such as asthma, arthritis, diabetes, obesity, atherosclerosis, certain cancers, and Alzheimer's disease. Social stressors and more precisely our perception of our environment has a profound impact on our overall health.

Let's nerd out!

The two main players that convert social or environmental adversity into inflammation are the sympathetic nervous system (SNS) and the hypothalamic-pituitary-adrenal (HPA) axis.

The SNS primes the immune system during a perceived threat by increasing pro-inflammatory molecules – remember, in the short term, inflammation can be a good thing!

In a normal state, the HPA axis actually lowers inflammation using a hormone called cortisol as part of a checks-and-balances system. However, in order for the HPA axis to do its job well, it can't be working all the time. When it does, it leads to a problem called glucocorticoid resistance or glucocorticoid insensitivity. This is where immune cells start to ignore the effects of cortisol. Think: the boy who cried "wolf." The end result is increased inflammation.

Bringing it all back together

Individuals with depression have higher levels of inflammation than non-depressed people. There is even evidence, albeit conflicting, that some anti-inflammatory medications can affect depressive symptoms. Overall, the science suggests that addressing inflammation both with the food we eat, and by reducing our overall level of "life stress" we can have a profound impact on our overall risk for depression and anxiety. Nutrition, exercise, sleep and mindfulness and spiritual activity work are easily accessible tools to combat a majority of chronic disease and anxiety and depression are no exception.

References

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