The Neuroinflammation Map: How Different Brain Regions Drive Symptoms Transcript

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Patient Case and Sudden Neuropsychiatric Decline

A few years ago, a young patient came into my office whose life had completely fallen apart. Just months earlier, he had been captain of the basketball team, an honor roll student, and a kid who seemed to have everything going for him.

Then, almost overnight, everything changed. He developed severe anxiety, obsessive thoughts, panic attacks, brain fog, and overwhelming fatigue. His personality changed.

He couldn't concentrate in school and his parents barely recognized him. Eventually, his symptoms became so severe that he was admitted to an inpatient psychiatric unit.

He had seen multiple doctors and specialists. Every test was normal. He was told it was stress, anxiety, depression, but what's actually happening was something much different.

His brain was inflamed. And that is what I want to talk to you about today. Neuro inflammation.

What Neuroinflammation Is and How Microglia Respond

Neuroinflammation refers to activation of the immune system within the brain and the central nervous system. At the center of this process are cells called microglia.

Microglia are the resident immune cells of the brain. I often describe them as the security guards and the cleanup crew of the brain. They consistently monitor the brain for infections, toxins, cellular injury, or other inflammatory signals coming from the body.

When they detect a threat, they activate and begin releasing inflammatory mediators or cytokines such as interleukin one, beta tumor necrosis factor alpha, and interleukin six, along with reactive oxygen species.

In the short term, this immune response is protective, but when microglia remain chronically activated, the inflammatory environment they create begins to disrupt neuronal signaling and damage the surrounding brain tissue.

And the symptoms that develop often depend on which region of the brain is being inflamed. For example, inflammation in the basal ganglia is strongly associated with pans and pandas, where children can develop sudden onset OCD, anxiety, tics, and dramatic behavioral changes.

Inflammation in the amygdala, the brain's fear center, can drive severe anxiety. Panic attacks, hypervigilance, and emotional dysregulation.

Brain Regions Affected by Inflammation

Inflammation in the motor cortex can contribute to movement abnormalities, tremors, weakness and coordination problems, and inflammation affecting the substantia nigra, which plays a critical role in dopamine production, can contribute to Parkinsonian symptoms such as slowed movement and motor rigidity.

So when patients present with neurological or other psychiatric symptoms, we need to begin thinking about which brain circuits may be inflamed. Now, if this inflammatory process persists long enough, it can begin to drive a deeper neurological change to the brain.

Two of the proteins most associated with neurodegenerative disease are beta amyloid plaques and phosphorylated

tau protein, or p tau. Most people associate these proteins with Alzheimer's disease, but in emerging research, it suggests that they may actually form as part of the brain's innate immune defense system.

Beta amyloid has antimicrobial properties and may be helping to trap invading pathogens. However, when inflammation becomes chronic, whether due to infection, toxins, or immune dysregulation, these proteins accumulate and over time they interfere with neuronal communication.

Chronic Inflammation, Amyloid, and Tau

They disrupt synapses and contribute to cognitive decline and ultimately, dementia. This also helps explain something clinicians see frequently. Treatment resistant anxiety or depression.

If the underlying driver of these symptoms is neuroinflammation, medications that only target neurotransmitters will provide limited relief because they don't address the underlying inflammatory process that is occurring in the brain and causing the symptoms in the patient population.

I treat one of the major drivers of neuroinflammation is vector borne disease organisms such as Borrelia, Bartonella, and Bbca can cross the blood brain barrier or trigger immune responses that activate the microglia.

Another major contributor is autoimmune driven neuroinflammation in conditions like Pans and Pandas.

Infectious and Autoimmune Drivers of Neuroinflammation

Antibodies generated against infections can cross react with neuronal tissue and the basal ganglia, a process called molecular mimicry, leading to inflammation and sudden onset of neuropsychiatric symptoms.

So the question becomes, how do we calm this inflammatory process and support the brain's recovery? In my clinical practice, botanical medicine plays a central role.

One of the most important herbs in my arsenal is Japanese knotweed. It contains resveratrol and other polyphenols that cross the blood brain barrier and help to reduce inflammatory cytokines while protecting neurons from oxidative stress.

Another powerful herb is Chinese skullcap. Its compounds back in help inhibit microglial activation and significantly reduce neuroinflammation. Other herbs I frequently use include cat's claw, which supports immune modulation, and Artemisia, which helps address infectious triggers of inflammation.

Diet is also critically important. A pro-inflammatory diet high in refined sugar processed foods. Seed oils can amplify immune activation throughout the body and the brain.

Botanical and Dietary Strategies for Brain Recovery

By contrast, an anti-inflammatory diet rich in phytonutrients and bio flavonoids helps to regulate the immune response and signaling and reduce oxidative stress.

I often encourage patients to eat a rainbow, consuming a wide variety of colorful fruits and vegetables that provide polyphenols, bio flavonoids, and antioxidants that support mitochondrial function and provide neuronal resilience.

Foods rich in omega three fatty acids, along with herbs and spices such as turmeric, ginger, and rosemary, can also help calm inflammation and inflammatory pathways.

When we address infections, calm immune dysregulation and support the brain with targeted botanicals as well as remove inflammatory triggers from the diet.

Something remarkable often happens the brain begins to heal. Cognition improves. Anxiety decreases. Energy returns because when we understand and treat the drivers of neuroinflammation, we are no longer just managing or suppressing symptoms.

We are helping to restore the brain's ability to heal itself, and that's where the magic happens. For more information on herbs that are able to help decrease neuroinflammation, check out Lime Core Botanicals.

You can find it at Lyme Corky. Com that's l y e c o r e.com.