Brain On Fire: Is Inflammation at the Root of Bipolar Disorder?

June 10, 2010 By David Evans

I do my best to follow science and medical news and it seems like every week there's another study showing that cellular inflammation is at the root of all kinds of diseases and conditions. You may be wondering, "What the heck is inflammation?"

It turns out that's a very good question, one that scientists are still struggling to answer definitively. One way to define inflammation is to view it as our body's way of responding to injury or threat, although this is oversimplifying things tremendously. If a cell is damaged, or works too hard, or if we are infected with a critter that isn't supposed to be inside of us, then microscopic proteins and amino acids are released that alert other cells to the problem. A chronically engaged cellular alert system can cause extensive tissue damage in the brain, clog up our arteries and ultimately provide an ideal environment for cancers to develop. There are dozens--actually probably hundreds--of inflammatory proteins, and we're finding new ones every day.

This week, it looks like scientists have added further evidence to the suspicion that brain cell inflammation might be at the root of another psychological problem: bipolar disorder. According to reporting by MedWire news, researchers at the Karolinska Institute in Stockholm found that microscopic structures--which are a sign of cellular inflammation in the brain--were present in the cerebrospinal fluid (CSF) of people with bipolar disorder, but not in people who are mentally healthy. The research team, led by Lennart Wetterberg, MD, PhD, was prompted to explore these microstructures by a series of studies showing similar inflammatory proteins in the CSF of people with schizophrenia.

Wetterberg's team suspected the same might be true of people with bipolar disorder, so they tapped the spinal fluid of 31 people with bipolar I--which is associated with severe mania--25 people with bipolar II--which is associated with a milder form of mania, and 20 people with no mental illness.

Ultimately Wetterberg and his colleagues found the inflammatory microstructures in 45 of the people with bipolar disorder, and the more likely to have bipolar I and to have experienced more severe manic episodes. In other words, the more severe the psychological disease, the more likely a person was to have these proteins.

While the study of inflammation and mental illness is in its infancy, the evidence that inflammation plays a central role in psych disorders is gathering rapidly and coming in from all sides. In fact, a number of recent studies have found that the ability to reduce inflammation in the brain and encourage the formation of new healthy brain cells might have more to do with how psych meds actually work than their impact on specific neurotransmitters, such as serotonin.

We haven't yet identified what causes inflammation in the first place--inflammation is likely spurred on by substances, such tobacco smoke to sugar, as well as an excels of fat in the gut. In fact, our own stress hormones can also set of a chain reaction of inflammation that ultimately damages healthy cells. We also don't know why some people seem more vulnerable to inflammation than others, however, and it will probably take decades to really get a grasp on it.

But I'm really encouraged by these studies. For one thing, inflammation is being implicated in all kinds of things, including cancer, cardiovascular disease, and aging itself. If it turns out that inflammation really is at the root of many types of mental illnesses, and if inflammation is something that we can easily and consistently measure, it could radically transform both the diagnosis and the treatment of psychological disorders.

It's possible that I'm overstating things here. I'm not a neuroscientist, nor a physician. I'm just an average guy, living with bipolar disorder, who has learned a lot about how the body--and science--is supposed to work. I'm encouraged, however, by the chance to finally give doctors and patients better tools for diagnosing and treating psychological problems. One of the primary weaknesses of modern psychology is the lack of consistency in how we define and identify the various disorders, and the lack of hard information on the biological underpinnings of psychological problems.

It's the lack of solid and consistent information--and evasions or prevarications on the part of the pharmaceutical industry and researchers most closely tied to them--that has led a growing number of people to be rightly skeptical about what mental health professionals tell us, and to question whether psychotherapy or medication even works at all. It doesn't help that a number of scientists and pharmaceutical companies have been caught with their metaphorical pants down when more rigorous scientific methods were used to explore how and whether various kinds of therapies and medicines work.

I'm not pinning all my hopes on biological interventions. There is obviously an environmental component to most psychological disorders, and we'll probably never get to a place with most illnesses where you can simply pop a pill and you'll be "all better."

I think we'll be better off, however, if we can more clearly understand what happens in the brain before, during and after people develop problems and from that begin to develop more targeted and rational treatments--whether those treatments are as simple as meditation and exercise or as complex as gene therapy.

Kay Redfield Jamison--the noted psychiatrist, author, and person living with bipolar disorder--penned a best seller back in 1996, which suggested that some of our most brilliant thinkers and

artists were possibly suffering from bipolar disorder. The book, presciently titled *Touched With Fire*, argued that the ravaging heat of mania might also provide the fuel for brilliance.

It’s possible that neurological inflammation induces mania, which can in turn provide the energy for artistic achievement. but most of us will never be a Mozart or a Virginia Woolf. I enjoy the effervescence and ecstasy of my “up” moods, and they do--at least in the beginning--increase my creative output. The price is awfully high, however, to my emotional and financial wellbeing, and to the health of my relationships. I’m not suggesting that we put out the fire entirely--a metaphor for life and vitality in many cultures--but the flame of mania can easily become an inferno, from which no one escapes alive.

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