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Take Control of Your Health

Can Ending Inflammation Help Beat Depression?

Analysis by Dr. Joseph Mercola | December 14, 2023

STORY AT-A-GLANCE

- Intermittent inflammation is critical to support life, but chronic inflammation is linked to depression and many chronic diseases that are the leading causes of mortality worldwide, such as heart disease, chronic kidney disease and diabetes
- Data show medications that reduce inflammation help reduce symptoms of depression, including in those with treatment-resistant depression. Medications like alpha interferon spike the inflammatory response and increase the risk of psychosis and depression
- Early life stressors that induce inflammation can increase the risk of chronic diseases and are associated with more stubborn forms of depression. Inflammation in the brain is also associated with fibromyalgia and may be linked to reduced cognitive function in older adults
- Black seed oil has anti-inflammatory properties that were studied to help lower the inflammatory response to COVID-19. Other nutrients that help lower inflammation include ginger, omega-3, vitamin E, turmeric and bromelain

Multiple studies have suggested that the inflammatory process is linked to the development of altered mood and depression.[1] Chronic inflammation can lead to several significant chronic diseases, which are some of the leading causes of mortality worldwide, such as diabetes, heart disease, chronic kidney disease, cancer and nonalcoholic fatty liver disease.[2]

Intermittent inflammation is critical to support life after an injury or infection. However, systemic chronic inflammation that results from social, lifestyle and environmental

factors promotes noninfectious chronic diseases that have come to dominate the leading causes of death worldwide.

More than 50% of deaths globally are attributed to diseases that are related to inflammation and emerging evidence suggests that the risk of chronic inflammation may trace back to childhood.[3] In many cases, lifestyle and environmental factors also promote systemic chronic inflammation, including physical inactivity, psychological stress and poor diet.

The bi-directional connection between depression and inflammatory processes has led researchers to theorize that anti-inflammatory treatments may have antidepressant effects.[4] However, the risk of side effects from these drugs requires cautious application.

Could Treating Inflammation Affect Depression?

Research data have demonstrated that inflammation is a common denominator between chronic illness and depression. Additionally, as National Geographic notes,[5] inflammation can also exacerbate mental health conditions. For example, a 2020 literature review[6] of 22 studies, found that depression is positively correlated in adolescents and children with current and future inflammatory responses.

For too long, depression was seen simplistically as a dysfunction of neurotransmitters, particularly serotonin and dopamine. While neurotransmitters do play a role in mood regulation and emotions, the subsequent development of selective serotonin reuptake inhibitors (SSRI) medications did not prove to correct the problem effectively, which means they don't play the only role, and may not play the major role.

A 2022 study[7] notes that the role of inflammation in patients with psychosis was recognized as early as 1980 and, since then, evidence continues to mount suggesting cytokines play a role in the pathophysiology of psychosis. However, rather than simply involving one or two cytokines, the research has shown that an imbalance in pro- and anti-inflammatory patterns is more likely the culprit.

Some believe that the strongest evidence that inflammation plays a significant role in depression and mood disorders comes from the use of alpha interferon, an inflammatory cytokine drug that works as an antiviral. Some of the significant side effects of this drug used to treat hepatitis C and other health conditions are psychosis and depression, also called cytokine-induced sickness behavior,[8] which is characterized by loss of energy and depression.

Cytokine levels and an inflamed immune response are associated with depression and fatigue, and early research in alpha interferon therapies found 17% of those treated with the drug developed psychiatric side effects, which improved when the drug was withdrawn.[9]

In other research, data showed that those who were treated with alpha interferon and suffered from depression had a higher risk of recurring episodes, which suggested to the researchers that the mood alterations were not transient.

Eléonore Beurel is a biochemist at the University of Miami Miller School of Medicine in Florida. She and her colleagues are researching the role inflammation plays in brain cell repair.[10] She notes that some studies have shown certain T cells and cytokines that can cross the blood-brain barrier affect the central nervous system's immune cells, which normally repair damage, but when exposed to inflammation, they damage neurons instead.

Early Life Stress-Induced Inflammation Linked to Chronic Illness

Researchers know that a history of childhood trauma increases the risk of adult depression.[11] Dr. Andrea Danese is a child and adolescent psychiatrist at King's College London. He believes that inflammation may help explain the association between childhood trauma and adult depression and treating it could help mitigate depression.[12]

As well as an association with depression, childhood maltreatment is also associated with an increased risk for physical health conditions such as cardiovascular disease and

Type 2 diabetes. Exposure to stress during childhood is associated with more stubborn forms of depression.

“Individuals who have a history of childhood maltreatment tend to have more chronic and more persistent types of depression and they also tend to respond more poorly to conventional treatment,” Danese said. “Inflammation may definitely be one of the biological reasons for why this happens.”[13]

Patients with treatment-resistant depression, those who respond poorly to conventional treatment, who also have high baseline inflammation, have found relief using anti-inflammatory medications, such as infliximab, a tumor necrosis factor (TNF) antagonist used to treat autoimmune disorders.[14]

Brain Inflammation Is One Hallmark of Fibromyalgia

Fibromyalgia is an often debilitating condition that is characterized by chronic, widespread pain that primarily affects women. Brain scans of patients with fibromyalgia reveal their threshold for tolerating pain impulses is substantially lower than most individuals. But the mechanism causing this lowered pain threshold is still unknown.

Using PET imaging, one investigation[15] revealed the presence of widespread brain inflammation in patients diagnosed with fibromyalgia. Earlier research[16] also revealed high concentrations of inflammatory cytokines in the cerebrospinal fluid, suggesting fibromyalgia patients have inflammation in other areas of the nervous system as well.

German researchers investigating inflammation mechanisms in the brain have also found that as mice get older and regulation of inflammatory responses becomes increasingly impaired, they start losing brain cells.[17]

Interestingly, the cannabinoid receptor type 1 (CB1), which produces the "high" in response to tetrahydrocannabinol (THC) in marijuana, also helps regulate inflammatory reactions in your brain. In short, chronic brain inflammation is in part driven by the CB1 receptors' failure to respond.

It appears that microglial cells release endocannabinoids, which then bind to CB1 receptors found in nearby neurons. These neurons then communicate directly with other nerve cells. So, this area of the brain's immune response is indirectly regulated.

Data from 2017[18] showed that THC can help restore cognitive function in older brains. Since the study was done on mice, further research is needed to confirm that the same mechanisms apply to humans, but it's compelling, nonetheless.

Anti-Inflammatory Properties of Black Seed Oil

There are several steps you can take to help reduce the inflammatory process in your body, and one of those may be black seed oil. The bioactive compounds in the oil have antihistamine and anti-inflammatory properties that down-regulate interferon regulatory factor 3 activation, which plays a critical role in the innate immune response.[19]

Black seed oil has been used for thousands of years for its therapeutic effects, and one 2020 study[20] suggests the oil has promising benefits in the treatment and prevention of COVID-19, as it may balance the inflammatory response and support autophagy.

Based on a review of past research the authors suggested the bioactive compounds in the seed, especially thymoquinone and nigelladine, could offer promising benefits. While short-term use of black seed oil may be efficacious in the treatment of COVID-19, long-term use for prevention may have other unwanted effects. One study[21] of the chemical composition of black seed oil shows 50.2% of the fatty acids are linoleic acid.

As I have written **linoleic acid (LA)** is likely the leading contributing cause of virtually all chronic diseases we have encountered in the last century. When LA is consumed in excessive amounts, it acts as a metabolic poison. Chances are you're getting an excess amount of this dangerous fat from foods that you may even consider healthy. For example, olive oil and chicken, which are fed LA-rich grains, increase your levels of omega-6 fatty acids.

Fight Inflammation With Nutrients

Some of the lifestyle changes that can improve mental health include exercise and diet.[22] Mediterranean-style eating has been shown to reduce depression symptoms. One of the factors that help regulate the immune response is the gut microbiome, which is positively impacted through healthy diet changes and exercise. Other lifestyle factors that influence inflammation include quality sleep, sun exposure and reduced stress.

"As we learn more about the role that lifestyle factors have to play in our mental health and also in inflammation, I think that provides quite an empowering message," Wolfgang Marx, senior research fellow at the Food & Mood Centre at Deakin University, told National Geographic.[23] "By exercising, by engaging with nature, by eating healthily, we can actually make a pretty substantial difference — not only in physical outcomes, but also our mental health."

Several **anti-inflammatory nutrients** can help you keep inflammation in check when you make a habit of including them in your diet.

Vitamin E prevents LA stored in your tissues from being oxidized into dangerous toxic byproducts. Since most people have LA scores that are 10 times higher than normal, and since excess LA is likely one of the primary contributors to chronic disease, it can be a good idea to take vitamin E regularly until you get your LA down to healthy levels, which may take up to six years for most people.

Omega-3 fats play a crucial role in the health and functionality of your cell membranes and the membranes of your mitochondria. Membranes are lipid structures made of phospholipids and other constituents. The foods you eat provide the raw material substrate that is assembled into the mitochondrial and cellular membranes.

If you're eating any processed foods, you're likely getting far too much LA, which damages your mitochondria. If you are not strict enough to reduce your LA intake and don't eat the right kinds of fish, you may benefit from an omega-3 supplement. I believe krill oil is superior to most fish oil supplements, which delivers omega-3 the way it is found in nature.

Ginger, which is easy to grow at home, has been shown to support immune system function and ameliorate autoimmune diseases such as lupus and rheumatoid arthritis by making neutrophils (a type of white blood cell) more resistant to neutrophil extracellular trap (NET) formation, which is known to propel inflammation and contribute to autoimmune diseases.[24]

Turmeric gives Indian curries their rich golden color and contains a polyphenol called curcumin, which exhibits more than 150 potentially therapeutic actions. Researchers have shown curcumin has antibacterial, anticancer, anti-inflammatory, antimalarial, antioxidant, antiparasitic, antiproliferative, pro-apoptotic and wound healing properties.

Glucosamine and chondroitin are compounds found in human cartilage, while MSM[25] is a sulfur-rich compound found in certain plants, fruits and vegetables. Research suggests glucosamine and chondroitin work synergistically when paired, and MSM can further boost their effects by enhancing cell penetration. All three have anti-inflammatory properties and are commonly used in the treatment of arthritis symptoms.

Glycine exerts potent anti-inflammatory effects by inhibiting the activation of immune cells and suppressing the production of proinflammatory cytokines. It acts on inflammatory cells like macrophages to block the signaling of the NLRP3 inflammasome.

Bromelain is an enzyme found in pineapples. It can reduce inflammation, joint pain and joint degradation, improve gut function and digestive health, and aid in the metabolism of amino acids.

Boswellic acid, extracted from the boswellia serrata tree, has a long history of use in traditional medicine. It can reduce pain and inflammation throughout the body, including arthritis pain.

Green tea extract contains a potent antioxidant catechin called EGCG, which combats inflammation, relieves joint and muscle soreness, and prevents future oxidative stress and damage.

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