Advances in Understanding of Depression Offers New Hope

By Dr. Mercola
January 22, 2015

Depression is thought to affect about one in 10 Americans.[1] In 2010, antidepressants were the second most commonly prescribed type of medication in the US,[2] hinting at the severity of the problem.

Contrary to popular belief, depression is not likely caused by unbalanced brain chemicals; however there are a number of *other* biological factors that appear to be highly significant. Chronic inflammation is one. As noted in the featured article:[3]

> *"George Slavich, a clinical psychologist at the University of California in Los Angeles, has spent years studying depression, and has come to the conclusion that it has as much to do with the body as the mind.*
>
> *'I don't even talk about it as a psychiatric condition anymore,' he says. 'It does involve psychology, but it also involves equal parts of biology and physical health.'*
>
> *The basis of this new view is blindingly obvious once it is pointed out: everyone feels miserable when they are ill. That feeling of being too tired, bored and fed up to move off the sofa and get on with life is known among psychologists as sickness behaviour.*
>
> *It happens for a good reason, helping us avoid doing more damage or spreading an infection any further. It also looks a lot like depression."*

One researcher even goes so far as to suggest depression should be rebranded as an infectious but non-contagious disease,[4] while the author of the featured article playfully compares depression with an allergic reaction—in this case "an allergy to modern life"—considering the many environmental factors that are known to cause inflammation, from diet to toxic exposures and stress.

Scientists have also found that your mental health can be adversely impacted by factors such as vitamin D deficiency and/or unbalanced gut flora—both of which, incidentally, play a role in keeping inflammation in check, which is really what the remedy to depression is all about.

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Inflammation and Depression

As discussed in an article by Dr. Kelly Brogan, depressive symptoms can be viewed as downstream manifestations of inflammation.

> *"The source itself may be singularly or multiply-focused as stress, dietary and toxic exposures, and infection... [I]nflammation appears to be a highly relevant determinant of depressive symptoms such as flat mood, slowed thinking, avoidance, alterations in perception, and metabolic changes,[5]"* she writes.

Certain biomarkers, such as cytokines in your blood and inflammatory messengers like CRP, IL-1, IL-6, and TNF-alpha, show promise as potential new diagnostic tools, as they're "predictive[6] and linearly[7] correlative" with depression.

For example, researchers have found[8] that melancholic depression, bipolar disorder, and postpartum depression, are associated with elevated levels of cytokines in combination with decreased cortisol sensitivity (cortisol is both a stress hormone and a buffer against inflammation). As explained by Dr. Brogan:

> *"Once triggered in the body, these inflammatory agents transfer information to the nervous system, typically through stimulation of major nerves such as the vagus, which connects[9] the gut and brain. Specialized cells called microglia in the brain represent the brain's immune hubs and are activated in inflammatory states.*
>
> *In activated microglia, an enzyme called IDO (indoleamine 2 3-dioxygenase) has been shown[10] to direct tryptophan away from the production of serotonin and melatonin and towards the production of an NMDA agonist called quinolinic acid that may be responsible for symptoms of anxiety and agitation.*
>
> *These are just some of the changes that may conspire to let your brain in on what your body may know is wrong."*

Using Brain Scans to Help Choose Treatment Type

Speaking of biomarkers, research[11] by Dr. Helen Mayberg, a professor of psychiatry at Emory University, may also pave the way toward a more refined and customized treatment plan. Her research is discussed in the video above.

Dr. Mayberg has identified a biomarker in the brain that can be used to predict whether a depressed patient is a good candidate for medication, or might be better off with psychotherapy. As noted by the *New York Times*:[12]

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"Patients who had low activity in a brain region called the anterior insula measured before treatment responded quite well to cognitive behavior therapy (CBT} but poorly to Lexapro; conversely, those with high activity in this region had an excellent response to Lexapro, but did poorly with CBT....

[T]he insula is centrally involved in the capacity for emotional self-awareness, cognitive control and decision making, all of which are impaired by depression. Perhaps cognitive behavior therapy has a more powerful effect than an antidepressant in patients with an underactive insula because it teaches patients to control their emotionally disturbing thoughts in a way that an antidepressant cannot."

The Links Between Gut and Mental Health

A number of studies have confirmed that gastrointestinal inflammation specifically can play a critical role in the development of depression, suggesting that beneficial bacteria (probiotics) may be an important part of treatment. For example, a Hungarian scientific review[13] published in 2011 made the following observations:

1. **Depression is often found alongside gastrointestinal inflammations and autoimmune diseases** as well as with cardiovascular diseases, neurodegenerative diseases, type 2 diabetes and also cancer, in which chronic low-grade inflammation is a significant contributing factor.

   Thus researchers suggested "depression may be a neuropsychiatric manifestation of a chronic inflammatory syndrome."

2. An increasing number of clinical studies have shown that **treating gastrointestinal inflammation with probiotics, vitamin B, vitamin D, may also improve depression symptoms** and quality of life by attenuating pro-inflammatory stimuli to your brain.

3. Research suggests **the primary cause of inflammation may be dysfunction of the "gut-brain axis."**

   Your gut is literally your second brain -- created from the identical tissue as your brain during gestation -- and contains higher levels of the neurotransmitter serotonin, which is associated with mood control.

   It's important to understand that your gut bacteria are an active and integrated part of serotonin regulation and actually produce more serotonin than your brain. Optimizing your gut flora is a key part of the equation to optimize your levels. If you consume loads of processed foods and sugars, your gut bacteria will be severely compromised because processed foods tend to decimate healthy microflora. This leaves a void that is filled by

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disease-causing bacteria and yeast and fungi that will promote inflammation and decrease the health of your second brain.

Low-Sugar Diet Is an Important Anti-Depressant Tool

Besides distorting your microflora, sugar also triggers a cascade of other chemical reactions in your body known to promote both chronic inflammation and depression. For starters, excessive sugar consumption leads to elevated insulin levels. That can have a detrimental impact on your mood and mental health by causing higher levels of glutamate to be secreted in your brain, which has been linked to agitation, depression, anger, anxiety, and panic attacks.

Sugar suppresses activity of a key growth hormone called BDNF (brain derived neurotrophic factor) which promotes healthy brain neurons. BDNF levels are critically low in both depression and schizophrenia, which animal models suggest might actually be causative.

Cultured and fermented foods, on the other hand, help reseed your gut with a wide variety of healthy bacteria that promote mental and physical health as long as your keep your sugar and processed food intake low. For instance, one 2011 study[14] found that the probiotic *Lactobacillus rhamnosus* has a marked effect on GABA levels in certain brain regions and lowers the stress-induced hormone corticosterone, resulting in reduced anxiety- and depression-related behavior. So the three-prong dietary answer for treating depression is to:

1. Severely limit sugars, especially fructose, as well as grains, as all forms of sugar feed pathogenic bacteria in your gut. The easiest way to do this is to avoid processed foods, and start cooking from scratch using whole ingredients. As a standard recommendation, I suggest limiting your daily fructose consumption from all sources to 25 grams per day or less.

2. Avoid foods with genetically engineered ingredients, as they too have been implicated in the destruction of gut flora, along with promoting chronic inflammation. Keep in mind that conventionally-grown foods may also be contaminated with glyphosate, which has been found to selectively destroy beneficial, health-promoting gut bacteria, so ideally, you'll want to make sure as much of your food as possible is organically grown to avoid pesticide exposure.

3. Introduce fermented foods into your diet to rebalance your gut flora.

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Beware that your gut bacteria are also very sensitive to and can be harmed by the following, all of which should be avoided:

Antibiotics, unless absolutely necessary (and when you do, make sure to reseed your gut with fermented foods and/or a probiotic supplement)	Conventionally-raised meats and other animal products, as CAFO animals are routinely fed low-dose antibiotics, plus genetically engineered grains
Chlorinated and/or fluoridated water	Antibacterial soap

Vitamin D Deficiency Predisposes You to Depression

Vitamin D deficiency is another important biological factor that can play a significant role in mental health. In one 2006 study,[15] seniors with vitamin D levels below 20 ng/ml were found to be 11 times more prone to be depressed than those with higher levels. It's worth noting that the mean vitamin D level was just under 19 ng/ml, which is a severe deficiency state. In fact, 58 percent of the participants had levels below 20 ng/ml. A 2007 study[16] suggested that vitamin D deficiency is responsible for symptoms of depression and anxiety in patients with fibromyalgia. Vitamin D deficiency is also a well-recognized cause in Seasonal Affective Disorder[17] (SAD). A double-blind randomized trial[18] published in 2008 also concluded that:

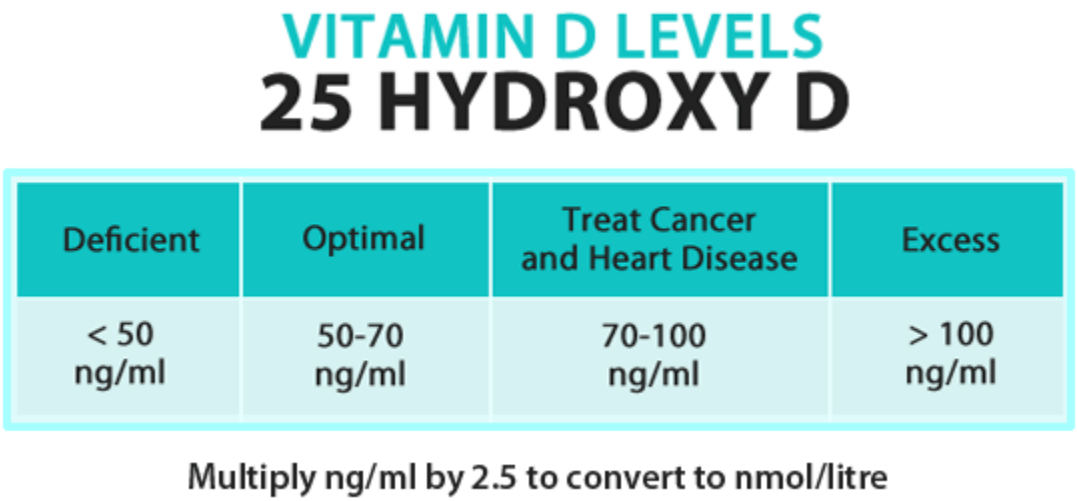
> "*It appears to be a relation between serum levels of 25(OH)D and symptoms of depression. Supplementation with high doses of vitamin D seems to ameliorate these symptoms indicating a possible causal relationship."*

More recently, researchers[19] found that seniors with depression had vitamin D levels that were 14 percent lower than those who were not depressed. Here, those with vitamin D levels below 20 ng/ml had an 85 percent increased risk of depression, compared to those with levels above 30 ng/ml. Yet another paper[20] published in 2011 noted that:

> *"Effective detection and treatment of inadequate vitamin D levels in persons with depression and other mental disorders may be an easy and cost-effective therapy which could improve patients' long-term health outcomes as well as their quality of life."*

Based on the evaluation of healthy populations that get plenty of natural sun exposure, the optimal range for general physical and mental health appears to be somewhere between 50 and 70 ng/ml. So, if you're depressed, you'd be well advised to get your vitamin D level checked, and to address any insufficiency or deficiency. The D*Action Project by GrassrootsHealth is one cost effective testing solution. As for optimizing your levels, sensible sun exposure is the ideal

way. Alternatively, use a tanning bed with an electronic ballast, and/or an oral vitamin D3 supplement. GrassrootsHealth has a helpful chart showing the average adult dose required to reach healthy vitamin D levels based upon your measured starting point. Keep in mind that if you opt for a vitamin D supplement, you also need to take vitamin K2 and magnesium, as these nutrients work in tandem.



There Are Many Alternatives to Drug Treatment

Antidepressant drugs come with a long laundry list of risks, and are therefore best left as a *last* resort, if all else fails. Medical journalist and Pulitzer Prize nominee Robert Whitaker has detailed the many drawbacks and benefits of various treatments in his two books: *Mad in America*, and *Anatomy of an Epidemic: Magic Bullets, Psychiatric Drugs, and the Astonishing Rise of Mental Illness in America*, noting that physical exercise actually comes out on top in most studies—even when compared against antidepressant drugs.

Exercise primarily works by helping to normalize your insulin levels while simultaneously boosting “feel good" hormones in your brain. But researchers have also discovered that exercise allows your body to eliminate kynurenine, a harmful protein associated with depression.[21] And, again showing the link between inflammation and depression, your body metabolizes kynurenine in the first place via a process that is activated by stress and inflammatory factors... While I addressed several dietary factors to restore health to your gut, I also recommend supplementing your diet with a high quality animal-based omega-3 fat, such as krill oil. This may be the single most important nutrient for optimal brain function, thereby easing symptoms of depression. Vitamin B12 deficiency can also contribute to depression, and affects one in four people.

Last but not least, make sure you get enough sleep. The link between depression and lack of sleep is well established. Of the approximately 18 million Americans with depression, more than half of them struggle with insomnia. While it was long thought that insomnia was a symptom of depression, it now seems that insomnia may precede depression in some cases.[22] Recent research also found that sleep therapy resulted in remarkable improvements in depressed patients. The take-home message here is that one or more lifestyle factors may be at the heart of your depression, so you'd be well advised to address the factors discussed in this article before resorting to drug treatment—which science has shown is no more effective than placebo, while being fraught with potentially dangerous side effects

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