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Diet Modifications to Treat Depression: A Potential Supplement to Pharmacological Medications

by Eric Bylund

Pharmacological drugs have become generally accepted as the primary form of treatment for depression, but simple modifications to diet should be another option taken into consideration. Antidepressant drugs are often expensive and have negative side effects, but some dietary supplements and or changes in diet are less of a financial burden and less physically detrimental. In studies of the role diet plays in depression, specific nutrients have been identified, including omega-3 lipids, zinc, folate, vitamin B12, and tryptophan, which shows particular promise in the treatment of depression. Although combinations of nutrients or treatments could negatively interact, further research could identify those combinations as well as combinations that most beneficial.

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Depression is often characterized by a lack of joy in daily activities, a diminished sense of self-worth, and an inability to function at a desired level. It is comorbid with high rates of chronic disease and relapse, and with other mental disorders. It is a widespread condition, found in developed countries as well as in developing and third-world countries (Bauer, Tharmanathan, Volz, Moeller, & Freemantle, 2009). In the United States, the National Health and Nutritional Examination Survey (NHANES) completed between 2004 and 2008 showed that 20.1% of respondents reported depressive symptoms (Ruth, Baltrus, Ye, & Rust, 2011).

In the U.S., a culture that emphasizes Western medicine, the treatment of depression focuses on pharmacological remedies. Blumenthal et al. (1999) reported that selective serotonin-reuptake inhibitors (SSRIs) had become the most widely used form of treatment for depression, followed by other anti-depressant medications, such as monoamine oxidase inhibitors and tricyclic antidepressants.

Continued use of these drugs has been proven to be effective, but there are some areas of concern. Mainly, they can be a financial burden for the patient, and they often have negative side effects. For example, a Swedish study found that the cost of drugs for the treatment of depression totaled the equivalent of \$130 million in 2005, a dramatic increase from the \$15 million spent in 1985 (Sobocki, Lekander, Borgström, Ström, & Runeson, 2007). Similar findings for the U.S. were reported by Morey, Thacher, and Craighead (2007). In addition, the side effects of anti-depressants include dry mouth, bladder problems, sexual dysfunction, blurred vision, dizzi-

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ness, nausea, nervousness, and insomnia (Rachel, 2000). An alternative form of treatment might reduce or eliminate both the financial burden associated with antidepressants as well as the adverse side effects.

The National Institute for Clinical Excellence (NICE, 2004) recommends careful consideration by physicians before prescribing anti-depressant drugs and specifically suggests that they should not be used as the first option in the treatment of mild depression, but rather reserved for cases of severe depression or when other forms of treatment fail.

One alternative treatment for depression consists of simple changes to diet in terms of the consumption of certain foods and nutrient supplements. Specifically, research on omega-3 lipids, zinc, folate, vitamin B12, and tryptophan has demonstrated their potential to reduce depressive symptoms. Although evidence also suggests that certain combinations of dietary treatments could have adverse side effects, these might be identifiable in future research and thus avoided.

General Dietary Habits and Depression

Several studies have examined the correlation between diet as a whole and symptoms of depression. Jacka et al. (2010a) utilized a healthy/unhealthy diet survey with a sample of Australian adolescents. The survey asked about their daily diet, such as whether they had breakfast each day, the number of servings of fruit and vegetables they consumed, and how much unhealthy food, such as hamburgers, sausages, donuts, pie, or soft drinks, they consumed. In

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general, the findings showed that, the poorer the diet, the more likely the participants were to be depressed.

Another study by Jacka et al. (2010b) involving Australian women found that a "Western" diet (that is, one consisting of processed or fried foods, refined grains, and sugar products) was associated with a higher prevalence of depression and anxiety than a "traditional" diet (one consisting of vegetables, fruit, meat, fish, and whole grains).

The Australian studies suggest the possibility that depressive symptoms could be treated using dietary changes. One weakness of the studies involves the issue of which foods should be considered healthy and which ones unhealthy. For example, many foods, such as hamburgers, arguably affect health in negative and positive ways. Studies of specific nutrients that are associated with depression, rather than general dietary habits, might be more helpful in determining the specific changes to diet that reduce depressive symptoms.

Vitamins and Nutrients Implicated in Depression

Harbottle and Schonfelder (2008) reviewed the extant literature and identified specific nutrients and vitamins associated with depression, including omega-3 lipids, zinc, folate, vitamin B12, and tryptophan.

Omega-3 Fatty Acids

Omega-3 fatty acids consist of a group of fats that cannot naturally be synthesized by the body and must come from the diet, commonly through marine sources (such as salmon, sardines, and tuna; Hu et al., 2002) and plant sources (such as flaxseed, walnuts,

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and canola oil; Parker et al., 2006). For example, a general finding is that, as fish consumption goes up across populations, depression rates go down (Harbottle & Schonfelder, 2008). Biochemical analyses have further shown that depressed individuals generally have lower levels of omega-3 fatty acids than those who are not depressed (Harbottle & Schonfelder, 2008).

Vitamin B12 and Zinc

Vitamin B12 is a water-soluble vitamin that plays a key role in normal brain and nervous system functioning (Bilic, Bilic, Zagar, & Juric, 2004). Zinc is an essential micronutrient and regarded by many to be the second most important metal for proper brain functioning (Singla & Dhawan, 2013). Deficiencies in both vitamin B12 and zinc have been found in depressed people (Harbottle & Schonfelder, 2008). High levels of vitamin B12 have been found in those who have recovered from depression, and it has been shown to be a beneficial supplement in the treatment of depression (Harbottle & Schonfelder, 2008).

Folate

Folate is a water-soluble form of vitamin B9, is essential in synthesizing and repairing DNA, and is necessary for certain chemical reactions within the body (Weinstein et al., 2013). A study (Tolmunen et al., 2003) of Finnish men grouped them according to dietary-folate intake. The lowest third were more at risk for depressive symptoms than those in the highest third. This remained true even after adjustments were made for potential confounding variables, such as smoking, alcohol consumption, socioeconomic status, and fat consumption.

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Tryptophan and Protein

Tryptophan has received the most research attention and research in terms of its effect on depression and its potential as a dietary supplement to treat depression. It is a natural precursor to serotonin, a neurotransmitter that has been closely linked to depression, as previously indicated. In addition, it is commonly found in many sources of protein. Harbottle and Schonfelder (2008) identified several studies in which tryptophan supplements had a greater effect on alleviating depression than placebo did.

Cortical spreading depression

One of the ways that depression is studied electrophysiologically involves cortical spreading depression (CSD), which has been consistently observed in depressed patients (see de Aguiar, de Aguiar, & Guedes, 2011). The authors reported research utilizing CSD to examine the interaction between nutrition and pharmacological treatments for depression. One study (Tolmunen et al., 2003) involved two groups of rats. One group was fed a protein-deficient diet and the other a protein-enriched diet. Both groups then received a dose of lithium (pharmacological agent often used in the treatment of depression). The lithium dose reduced CSD susceptibility in the protein-deprived rats. The same dose in the protein-supplemented rats had no effect on CSD susceptibility (de Aguiar et al. 2011).

Conclusion

The potentially harmful side effects of anti-depressant drugs are reason to search for alternative forms of treatment. I have summarized efforts to identify dietary components that are promising.

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Although findings thus far cannot be considered conclusive, they warrant further research. For example, although zinc has shown promise as a beneficial supplement (Harbottle & Schonfelder, 2008), more remains to be learned about effective dosage and about potential side effects, especially in combination with other potential supplements.

Another potential direction for research is longitudinal studies in which dietary supplements introduced at an early age may reduce or eliminate the symptoms of depression in later life. Finally, certain combinations of drugs and nutrients could have beneficial effects in the treatment of depression—another possibility that deserves further study.

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