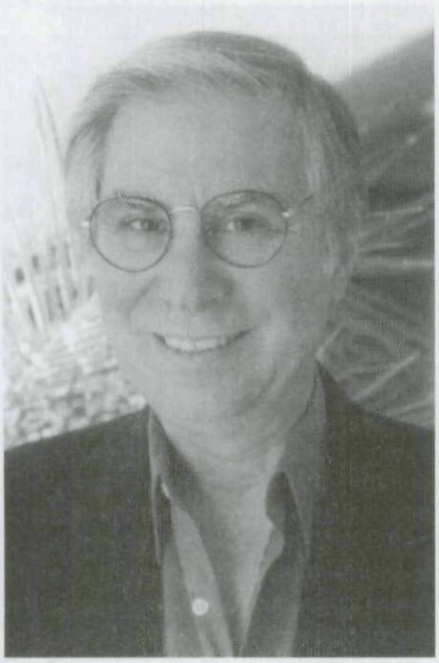

Nutritional Influences on Illness

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Vitamins and Minerals in Bipolar ("Manic-Depressive") Disorder

Vitamins

Folic Acid Deficiency

Folic acid deficiency, the most common nutrient deficiency, may be found in over one-quarter of hospitalized psychiatric patients.[1] It appears to affect mood by impairing the synthesis of tetrahydrobiopterin (BH4), a cofactor essential for the synthesis of serotonin and other monoamines involved in the pathogenesis of affective disorders.[2] One study found that lower plasma folate levels were associated with a greater risk of mood disorder.[3] Later studies, however, failed to confirm this relationship.[4]

Vitamin B12 Deficiency

Vitamin B12 is often deficient in hospitalized psychiatric patients. In fact, one study found 30 times the percentage of hospitalized mental patients with below normal levels of vitamin B12 as compared to the general population.[5] Even in the absence of clinical features of pernicious anemia (a common finding in vitamin B12 deficiency), vitamin B12 deficiency may cause a secondary mania. Neurological signs are usually present, although they may be subtle. In this case, supplementation may resolve the manic symptoms.[6,7]

Vitamin C

Certain bipolar patients may be deficient enough in vitamin C to be in a state of "subscurvy."[8] Moreover, manic excitement may increase the breakdown of ascorbic acid.[9] If vitamin C is deficient, results of a small double-blind study suggest that supplementation may reduce both manic and depressive symptoms.[10]

Vitamin C supplementation may also be therapeutic even when ascorbic acid nutriture is unknown (and thus could be adequate). In a double-blind study, 23 hospitalized patients (11 manic; 12 depressed) were rated as to symptoms, given 3 g of ascorbic acid or placebo, and then rated hourly for the next six hours. The same procedure was repeated the following day except that the ascorbic acid and placebo were switched. On both days, illness severity fell slowly during the day in the placebo group but much more rapidly in the treated group. These differences were significant at three, four, and five hours post-ingestion.[11]

Another double-blind study investigated the combined effects of ascorbic acid with EDTA in bipolar disorder. The experimental regime was as effective as amitriptyline (an antidepressant drug) for depressed patients, while manic patients responded better to lithium.[12]

It has been theorized that vitamin C may reduce symptoms of bipolar disorder by decreasing the detrimental effects of vanadium on erythrocyte Na^+-K^+-ATPase activity. It is believed to do so by reducing vanadate (+5) to the vanadyl ion (+4), the latter being a much less effective inhibitor of Na^+-K^+-ATPase activity.[13] (See Vanadium below.)

Minerals

Lithium

Given that pharmacological dosages of lithium are a major form of therapy in bipolar disorder, much has been written on the subject. Particularly interesting is the finding that the efficacy of lithium treatment is directly correlated with serum folate levels,[14] and folate supplementation (200 mcg daily) has been shown under double-blind conditions to enhance the efficacy of lithium treatment.[15]

A small amount of data concerning the nutritional aspects of lithium suggests that low levels of nutrient intake may be inversely related to the risk of serious mental illness.[16] Furthermore, the results of a small pilot

continued on page 175 ➤

➤ continued from page 176

study suggest that supplementation with low-dose natural lithium supplementation may be effective in alleviating bipolar depression.[17] The possible efficacy of nutritional lithium supplementation is especially intriguing because of the common problem of side effects from the administration of pharmacological levels of lithium.

Vanadium

Bipolar patients may have increased plasma vanadium levels, even after recovery.[18] While plasma, but not hair, vanadium may be increased during depression, vanadium levels in both plasma and hair have been found to be elevated during mania.[19] In addition, vanadium toxicity is known to be associated with depression and melancholia.[20]

Reduction in the activity of the Na^+-K^+-ATPase pump is a possible cause of both manic and depressive phases of the disorder,[21] and lymphocytes from manic-depressives are impaired in their ability to produce new Na^+-K^+-ATPase pump sites in response to challenges.[22] Vanadium is a powerful inhibitor of Na^+-K^+-ATPase activity.[23] In patients with bipolar disorder – but not in normals – increased plasma vanadium is negatively correlated with Na^+-K^+-ATPase activity.[24]

Consistent with the theory that vanadium is a causal factor, medications given to treat bipolar disorder antagonize vanadium's effects. Lithium administration, which increases Na^+-K^+-ATPase activity,[22] appears to lower vanadium levels.[25] Phenothiazines, much like vitamin C, catalyze the reduction of vanadate to the less active vanadyl ion,[26] while carbamazepine has been shown *in vitro* to largely reverse the inhibition by vanadate of the Na^+-K^+-ATPase of erythrocytes.[27]

Therapies – including vitamin C (see above) – that decrease vanadate levels in the body have been reported to be effective in both depression and mania.[22] In fact, decreasing dietary vanadium intake along with the administration of the mineral chelator EDTA has been shown to reduce both mania and depression under double-blind conditions.[11]

Combined Nutrient Supplementation

Eleven patients with bipolar disorder were treated for six months with a moderate-potency, broad-range nutritional formula manufactured by Evince International (http://www.equilib.us/pages/@id=10.aspx). During the study, the severity of depression decreased on average by 71%, and the severity of mania decreased by 60%.[28] These are intriguing early findings; hopefully, a well-designed controlled trial will now be undertaken to see if these results can be confirmed.

Dr. Werbach cautions that the nutritional treatment of illness should be supervised by physicians or practitioners whose training prepares them to recognize serious illness and to integrate nutritional interventions safely into the treatment plan.

Nutritional Influences on Illness

Notes

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