

Nutrition and Mental Illness

Sampling of the Current Scientific Literature – Part 2

by Gary Null, Ph.D. and Martin Feldman, M.D.

For the past 40 years the mainstream medical establishment has denied the connection between nutrition and physical disease states. The mental health establishment has followed suit, with orthodox psychiatry and psychology contending that nutrition has no bearing on mental conditions. Yet the reality is that an objective review of mainstream scientific literature reveals the following: For virtually every major mental illness, quality studies exist showing that there are significant nutritional influences. So there is a kind of schizophrenia on the part of most mental health practitioners in that their reality is at odds with what has actually been going on in the real world of research.

The sad fact is that just because something important has been discovered and the results replicated, a paradigm shift will not necessarily occur. Where long-held beliefs conflict with new findings, it is usually the case that the beliefs continue to hold sway for a considerable time. In fact, it is often the *belief* in a therapy, rather than its true safety and efficacy, that supports its continued use. As a result, we see the phenomenon of old therapies – even antiquated and iatrogenic ones – dying a protracted death; these outdated treatments are chronically terminal but never seem to completely expire, as they linger on in that limbo of being supported not by patient cures but by medical megalomania and conceit.

To counter this state of affairs, and to set the record straight for those who would denigrate nutritional and orthomolecular approaches to mental health, we have compiled a sampling of scientific references that support these newer approaches. All of the following references are from peer-reviewed journals. They are based on sound science, not on tradition. Hopefully, as those in the mental health field become more aware of what has been happening in the research arena, the results herein will be widely acknowledged and applied.

Anorexia

- Evidence of zinc deficiency in anorexia nervosa and bulimia nervosa. Schauss AG; Bryce-Smith D. *Nutrients and brain function*; editor, WB Essman. Basel: Karger, c 1987. p. 151-162.

A review is presented on the use of zinc in treating anorexia nervosa, and on the zinc taste-test for assessing zinc deficiency, which is frequent in anorexics.

- Nutrition in the elderly [clinical conference]. Morley JE; Mooradian AD; Silver AJ; Heber D; Alfin-Slater RB. *Annals of Internal Medicine*, 1988 Dec 1, 109(11):890-904.

Unrecognized depression is a common, and treatable, cause of loss of appetite in the elderly. Lack of vitamin D can be a problem, due to decreased exposure to sunlight, and lack of ability to form this vitamin. Zinc and selenium levels may be low, which can lead to deteriorating vision and increased cancer risk, respectively.

- Zinc absorption in anorexia nervosa. Dinsmore, WW; Alderdice, JT; McMaster, D; Adams, CEA; Love, AH. *Lancet*. Boston, Mass.: Little, Brown and Company. May 4, 1985. v.1 (8):1041-1042.

Anorexics have a lower intestinal uptake of zinc than do normal subjects.

Anxiety

- Effect of a herbal psychotropic preparation, BR-16A (Mentat), on performance of mice on elevated plus-maze. Verma A; Kulkarni SK. *Indian Journal of Experimental Biology*, 1991 Dec, 29(12):1120-3.

In experiments with mice, the herbal preparation BR-16A (Mentat) was shown to reduce anxiety.

- Magnesium, schizophrenia and manic-depressive disease. Kirov GK; Tsachev KN. *Neuropsychobiology*, 1990, 23(2):79-81.

Magnesium levels in the blood of schizophrenic and depressed patients were shown to be lower than normal. The levels increased for those schizophrenics achieving clinical remission. It is hypothesized that the high stress level in severely ill psychiatric patients can sometimes lead to magnesium deficiency, which in turn could exacerbate symptoms such as anxiety, fear, hallucinations, weakness, and physical complaints.

- Pre-operative anxiety and serum potassium. McCleane GJ; Watters CH. *Anaesthesia*, 1990 Jul, 45(7):583-5.

Two hundred pre-operative patients were assessed for anxiety, and the most anxious ones showed lowered blood potassium levels.

- Role of an indigenous drug geriforte on blood levels of biogenic amines and its significance in the treatment of anxiety neurosis. Upadhyaya L; Tiwari AK; Agrawal A; Dubey GP. *Activitas Nervosa Superior*, 1990 Mar, 32(1):1-5.

The herbal preparation Geriforte was found effective in reducing anxiety and stress in neurotic anxiety patients.

- The impact of selenium supplementation on mood. Benton D; Cook R. *Biological Psychiatry*, 1991 Jun 1, 29(11):1092-8.

To look into the possibility that a subclinical deficiency of selenium exists in a sample of the British population, 50 subjects were given either a selenium supplement or a placebo, in a double-blind study over five weeks. The selenium was shown to elevate mood and, in particular, to decrease anxiety, and these effects were more pronounced in those subjects who had lower levels of selenium in their diets to begin with. The results are discussed in terms of the low level of selenium in the food chain in some parts of the world.

- Vitamin B12 and folic acid serum levels in obsessive compulsive disorder. Hermesh H; Weizman A; Shahar A; Munitz H. *Acta Psychiatrica Scandinavica*, 1988 Jul, 78(1):8-10.

Vitamin B12 deficiency was shown to be associated with a subgroup of patients with obsessive compulsive disorder.

- Vitamin C status in chronic schizophrenia. Suboticanec K; Folnegovic-Smalc V; Korbar M; Mestrovic B; Buzina R. *Biological Psychiatry*, 1990 Dec 1, 28(11):959-66.

Schizophrenic patients on the same hospital diet as control group patients showed lower levels of vitamin C in their blood, and even when they were supplemented to normalize their blood levels of the vitamin, levels excreted in their urine remained lower than those of the control group. The results support the view that schizophrenic patients need more vitamin C than the suggested requirement for healthy people.

- Effect of a special kava extract in patients with anxiety, tension, and excitation states of non-psychotic genesis. Double blind study with placebos over 4 weeks. Kinzler E; Kromer J; Lehmann E. *Arzneimittel-Forschung*, 1991 Jun, 41(6):584-8.

In a double-blind study, patients with anxiety syndrome not caused by psychotic disorders were treated with either kava extract or a placebo. A significant, and progressive, anxiety-reducing effect was seen for the kava over a period of four weeks. No side effects were noted.

- Psychosomatic dysfunctions in the female climacteric. Clinical effectiveness and tolerance of Kava Extract WS 1490. Warnecke G. *Fortschritte der Medizin*, 1991 Feb 10, 109(4):119-22.

In a double-blind study, kava extract worked better than a placebo in relieving menopausal symptoms, and was well-tolerated.

Autism

- Biotin-responsive infantile encephalopathy: EEG-polygraphic study of a case. Colamaria V; Burlina AB; Gaburro D; Pajno-Ferrara F; Saudubray JM; Merino RG; Dalla Bernardina B. *Epilepsia*, 1989 Sep-Oct, 30(5):573-8.

An infant suffering from autistic-like behavior, progressive lethargy, muscle spasms, generalized seizures, and other symptoms was treated with biotin twice daily and showed dramatic improvement of all symptoms.

- Controversies in the treatment of autistic children: vitamin and drug therapy. Rimland B. *Journal of Child Neurology*, 1988, 3 Suppl:S68-72.

A survey of approximately 4000 questionnaires completed by parents of autistic children provided ratings of various treatments. Among the biomedical treatments, the highest-ranking one was the use of high-dosage vitamin B6 and magnesium, with 8.5 parents reporting behavioral improvement to every one reporting behavioral worsening. The most-used drug on the list, thioridazine hydrochloride (Mellaril), came in fourth, with a helped-worsened ratio of 1.4:1.

- The effects of combined pyridoxine plus magnesium administration on the conditioned evoked potentials in children with autistic behavior. Martineau J; Barthelemy C; Roux S; Lelord G. *Curr. Top. Nutr. Dis.*, New York, NY: Alan R. Liss. 1988. v.19:357-362.

Vitamin B6 plus magnesium was shown to be effective in the treatment of autistic children.

- Nutritional treatments currently under investigation in autism. Coleman M. *Clin. Nutr.*, St. Louis, MO: CV Mosby Co. Sept/Oct 1989. v.8(5):210-212.

Autism has multiple causes, and many types of autism can be treated by nutritional approaches, e.g., the folic acid therapy of the fragile X syndrome, the low-phenylalanine diet of phenylketonuria, the restricted purine diet of purine autism, the high-calcium diet of autism with hypocalcemia, and the ketogenic diet of autism with lactic acidosis. Such targeted therapies appear to be the future approach to autism.

- Vitamin B6 versus fenfluramine: A case-study in medical bias. Rimland B. *J. Nutr. Med.* Abingdon, UK: Carfax Pub. Co. 1991. v.2(3):321-322.

Vitamin B6 and magnesium – as opposed to the drug fenfluramine – constitute the first-choice treatment in the treatment of autistic children and adults.

Bipolar Disorder

- Abnormal intracellular calcium ion concentration in platelets and lymphocytes of bipolar patients. Dubovsky SL; Murphy J; Thomas M; Rademacher J. *American Journal of Psychiatry*, 1992 Jan, 149(1):118-20.

There seems to be a disturbance in calcium regulation in the systems of patients with bipolar disorder.

- Calcium function in affective disorders and healthy controls. Bowden CL; Huang LG; Javors MA; Johnson JM; Seleshi E; McIntyre K; Contreras S; Maas JW. *Biological Psychiatry*, 1988 Feb 15, 23(4):367-76.

Calcium activity was shown to be abnormal in bipolar depressed and manic patients, and in unipolar patients. Also, unipolar and bipolar patients showed different types of disturbances in calcium metabolism.

- Elevated platelet intracellular calcium concentration in bipolar depression. Dubovsky SL; Lee C; Christiano J; Murphy J. *Biological Psychiatry*, 1991 Mar 1, 29(5):441-50.

It is suggested that untreated bipolar depressed patients had changes in calcium regulation within their cells that were not characteristic of untreated unipolar depressed patients.

- Folate concentration in Chinese psychiatric outpatients on long-term lithium treatment. Lee S; Chow CC; Shek CC; Wing YK; Chen CN. *Journal of Affective Disorders*, 1992 Apr, 24(4):265-70.

While folate deficiency is uncommon among Chinese psychiatric patients, it was shown that patients with a good response to lithium treatment over one year had a higher folate level in their blood than those showing an unsatisfactory response. This supports recent evidence that folate at high concentrations enhances the benefits of lithium.

- Folic acid enhances lithium prophylaxis. Coppen A; Chaudhry S; Swade C. *Journal of Affective Disorders*, 1986 Jan-Feb, 10(1):9-13.

In a double-blind study of patients on lithium therapy, those receiving a folic acid supplement showed a significant reduction of their symptoms compared to a group receiving a placebo.

- Further studies of vanadium in depressive psychosis. Naylor GJ; Corrigan FM; Smith AH; Connelly P; Ward NI. *British Journal of Psychiatry*, 1987 May, 150:656-61.

Changes in tissue vanadium concentration may explain the changes in sodium transport that occur in depressive psychosis.

- Incorporation of inositol into the phosphoinositides of lymphoblastoid cell lines established from bipolar manic-depressive patients. Banks RE; Aiton JF; Cramb G; Naylor GJ. *Journal of Affective Disorders*, 1990 May, 19(1):1-8.

Patients with manic-depressive disorder showed lower uptake of inositol when compared with a control group.

- Lithium mechanisms in bipolar illness and altered intracellular calcium functions. Meltzer HL. *Biological Psychiatry*, 1986 May, 21(5-6):492-510.

Calcium acts between cells in a variety of ways by activating a wide range of enzymes. Since lithium seems to alter many calcium-dependent processes, it may be that bipolar illness is a result of disturbances in calcium-regulated functions.

- Long-term lithium treatment. Some clinical, psychological and biological aspects. Smigan L. *Acta Psychiatrica Scandinavica*, 1985 Feb, 71(2):160-70.

Patients with affective disorders who responded favorably to lithium treatment showed a rise in calcium levels in their blood during the first 4 months of treatment. Those who did not respond to lithium showed unaltered calcium levels.

- Red cell folate concentrations in psychiatric patients. Carney MW; Chary TK; Laundry M; Bottiglieri T; Chanarin I; Reynolds EH; Toone B. *Journal of Affective Disorders*, 1990 Jul, 19(3):207-13.

Depressed patients were found to have low folate levels.

- The calcium second messenger system in bipolar disorders: data supporting new research directions. Dubovsky SL; Murphy J; Christiano J; Lee C. *Journal of Neuropsychiatry and Clinical Neurosciences*, 1992 Winter, 4(1):3-14.

Irregularities in calcium's signal-sending actions within cells may explain bipolar disorders. Lithium and other mood-stabilizing treatments seem to work by regulating calcium ion hyperactivity.

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- The use of sodium and potassium to reduce toxicity and toxic side effects from lithium. Cater RE. *Medical Hypotheses*, 1986 Aug, 20(4):359-83.

In rats, toxic side effects of lithium were prevented by feeding sodium and potassium. While sodium alone has been used to reduce side effects in humans, it can reduce lithium's benefits. Evidence suggests that using both sodium and potassium together would be better because the lithium dose could be slightly raised without adverse effect.

- Trace elements and the electroencephalogram during long-term lithium treatment. Harvey NS; Jarratt J; Ward NI. *British Journal of Psychiatry*, 1992 May, 160:654-8.

Raised bromine levels have been found in patients during lithium treatment, and it is suggested that bromine may aid the therapeutic effect of lithium.

- Vanadium and other trace elements in patients taking lithium. Campbell CA; Peet M; Ward NI. *Biological Psychiatry*, 1988 Nov, 24(7):775-81.

Compared to controls, patients on lithium had lower levels of vanadium and cobalt in their blood, and higher levels of aluminum.

- Vitamin B12 and folate status in acute geropsychiatric inpatients: affective and cognitive characteristics of a vitamin nondeficient population. Bell IR; Edman JS; Marby DW; Satlin A; Dreier T; Liptzin B; Cole JO. *Biological Psychiatry*, 1990 Jan 15, 27(2):125-37.

A study was done of geriatric patients admitted to a psychiatric hospital. Although they were not generally vitamin-deficient, those with below-median values of vitamin B12 and folate had more severe psychiatric problems than those with higher levels of one or both vitamins. It is suggested that biochemically interrelated vitamins such as B12 and folate may exert both a separate and combined influence on mental state, and that poorer vitamin status may contribute to some psychiatric disorders in the elderly.

- Vitamin B6 in clinical neurology. Bernstein AL. *Annals of the New York Academy of Sciences*, 1990, 585:250-60.

Vitamin B6 supplementation may be useful in treating a number of conditions. For instance, headache, chronic pain, and depression, all associated with serotonin deficiency, have, in some studies, been shown to have been helped by B6, which raises serotonin levels. In addition, B6 may reverse the effects of toxic substances associated with hyperactivity and aggressive behavior.

Bulimia

- Plasma and cerebrospinal fluid measures of arginine vasopressin secretion in patients with bulimia nervosa and in healthy subjects. Demitrack MA; Kalogeras KT; Altemus M; Pigott TA; Listwak SJ; Gold PW. *Journal of Clinical Endocrinology and Metabolism*, 1992 Jun, 74(6):1277-83.

Normal-weight female bulimic patients who had abstained from binge eating and purging for at least a month were studied. It was shown that they had irregularities in the hormonal process that regulates fluid volume in the body, a fact that may be relevant to their behavior.

- The effect of bulimia upon diet, body fat, bone density, and blood components. Howat PM; Varner LM; Hegsted M; Brewer MM; Mills GQ. *Journal of the American Dietetic Association* 1989 Jul, 89(7):929-34.

Bulimic subjects were compared with controls, and it was found that the bulimics' folacin intake was significantly lower than that

of the controls. Also, the bulimics consumed lower quantities of vitamin/mineral supplements, and their bone mineral densities and hemoglobin levels were lower.

- Zinc deficiency and eating disorders. Humphries L; Vivian B; Stuart M; McClain CJ. *Journal of Clinical Psychiatry*, 1989 Dec, 50(12):456-9.

Zinc status was evaluated in bulimic and anorexic patients, many of whom were found to be deficient in the mineral. This is due to a variety of reasons – lower dietary intake of zinc, impaired absorption, vomiting, diarrhea, and bingeing on low-zinc foods. Since zinc deficiency results in decreased food intake, the acquired zinc deficiency of bulimics and anorexics could exacerbate their altered eating behavior.

- Zinc status before and after zinc supplementation of eating disorder patients. McClain CJ; Stuart MA; Vivian B; McClain M; Talwalker R; Snelling L; Humphries L. *Journal of the American College of Nutrition*, 1992 Dec, 11(6):694-700.

Since reduced food intake results from zinc deficiency, the acquired zinc deficiency of eating disorder patients may act as a sustaining factor for their abnormal eating behavior. Hospitalized bulimics and anorexics were shown to be deficient in the mineral, and to benefit from supplementation.

Candida

- *Allium sativum* (garlic) inhibits lipid synthesis by *Candida albicans*. Adetumbi M; Javor GT; Lau BH. *Antimicrobial Agents and Chemotherapy*, 1986 Sep, 30(3):499-501.

Garlic extract was shown to inhibit the proliferation of the *Candida albicans* fungus.

- Carrot phytoalexin alters the membrane permeability of *Candida albicans* and multilamellar liposomes. Amin M; Kurosaki F; Nishi A. *Journal of General Microbiology*, 1988 Jan, 134 (Pt 1):241-6.

Carrots have an ingredient that inhibits the candida organism by damaging its cell membranes.

- Effect of calcium ion uptake on *Candida albicans* morphology. Holmes AR; Cannon RD; Shepherd MG. *Fems Microbiology Letters*, 1991 Jan 15, 61(2-3):187-93.

Calcium was shown to inhibit the growth of *Candida albicans* yeast cells.

- Inhibition of *Candida* adhesion to buccal epithelial cells by an aqueous extract of *Allium sativum* (garlic). Ghannoum MA. *Journal of Applied Bacteriology*, 1990 Feb, 68(2):163-9.

Garlic extract inhibits the adhesion of candida cells to human cells taken from the inside of the cheek.

- Respiratory burst and candidacidal activity of peritoneal macrophages are impaired in copper-deficient rats. Babu U; Failla ML. *Journal of Nutrition*, 1990 Dec, 120(12):1692-9.

In rats, a copper-deficient diet resulted in reduced resistance to candida cells. Rats fed a diet with adequate copper, by contrast, had better systemic defenses against candida.

- Studies on the anticandidal mode of action of *Allium sativum* (garlic). Ghannoum MA. *Journal of General Microbiology*, 1988 Nov, 134 (Pt 11):2917-24.

Garlic extract slows the growth of *Candida albicans* by affecting the outer surface of the cells and reducing their oxygen consumption, among other means.

Dementia

- Calcium and phosphorus levels in serum and CSF in dementia. Subhash MN; Padmashree TS; Srinivas KN; Subbakrishna DK; Shankar SK. *Neurobiology of Aging*, 1991 Jul-Aug, 12(4):267-9.

There is a significant decrease in levels of calcium and phosphorus in the cerebrospinal fluid of patients with Alzheimer's-type dementia and in dementia caused by blood-vessel disease or stroke. The drops in the levels of these minerals in the patient groups go beyond those associated with normal aging.

- Cephaloconiosis: a free radical perspective on the proposed particulate-induced etiopathogenesis of Alzheimer's dementia and related disorders. Evans PH; Klinowski J; Yano E. *Medical Hypotheses*, 1991 Mar, 34(3):209-19.

It is suggested that Alzheimer's dementia and related disorders are caused by fiber-like deposits of inorganic substances in the brain. Antioxidants – either micronutrients or pharmacological agents – may be therapeutic.

- Double-blind, placebo controlled study of acetyl-l-carnitine in patients with Alzheimer's dementia. Rai G; Wright G; Scott L; Beston B; Rest J; Exton-Smith AN. *Current Medical Research and Opinion*, 1990, 11(10):638-47.

Patients with Alzheimer's-type dementia were treated with acetyl-l-carnitine and compared with a control group. The treated group showed less deterioration than did the group receiving placebos, particularly in the area of short-term memory.

- Low serum cobalamin levels in primary degenerative dementia. Do some patients harbor atypical cobalamin deficiency states? Karnaze DS; Carmel R. *Archives of Internal Medicine*, 1987 Mar, 147(3):429-31.

Low levels of vitamin B12 in the blood are frequent in cases of primary degenerative dementia.

- Treatment of Alzheimer-type dementia with intravenous mecobalamin. Ikeda T; Yamamoto K; Takahashi K; Kaku Y; Uchiyama M; Sugiyama K; Yamada M. *Clinical Therapeutics*, 1992 May-Jun, 14(3):426-37.

Intravenous mecobalamin was seen to be a safe and effective treatment for patients with Alzheimer's-type dementia; it improved intellectual functions, such as memory, as well as emotional functions and communication abilities.

Depression

- Acute antidepressant effect of lithium is associated with fluctuation of calcium and magnesium in plasma. A double-blind study on the antidepressant effect of lithium and clomipramine. Linder J; Fyro B; Pettersson U; Werner S. *Acta Psychiatrica Scandinavica*, 1989 Jul, 80(1):27-36.

Lithium treatment of patients with major depressive disorder was associated with fluctuations in blood calcium and magnesium levels. These fluctuations were not seen in treatment with the drug clomipramine.

- Erythrocyte electrolytes in psychiatric illness. Esche I; Joffe RT; Blank DW. *Acta Psychiatrica Scandinavica*, 1988 Dec, 78(6):695-7.

Fluctuations in sodium and potassium were found within the red

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blood cells of patients with psychiatric disorders experiencing changes in mood state. These fluctuations were not found in a healthy control group.

- Levels of copper and zinc in depression. Narang RL; Gupta KR; Narang AP; Singh R. *Indian Journal of Physiology and Pharmacology*, 1991 Oct, 35(4):272-4.

Copper levels in depressed patients were significantly higher than those in controls, as well as higher than those in the same patients after they had recovered from depression. Zinc levels in depressed patients were not significantly lower than those of controls, but they were significantly lower than those of the same patients once they had recovered.

- Myths about vitamin B12 deficiency. Fine EJ; Soria ED. *Southern Medical Journal*, 1991 Dec, 84(12):1475-81.

Deficiency of vitamin B12 can cause nerve problems, depression, and dementia. Vitamin B12 replacement should be given to patients with borderline levels of the vitamin, since the advantages of doing so outweigh any disadvantages of therapy.

- Nutritional aspects of psychiatric disorders. Gray GE; Gray LK. *J Am Diet Assoc*. Chicago, IL: The Association. Oct 1989. v.89(10):1492-8.

Dietitians have a role as part of a multidisciplinary team in the treatment of psychiatric patients. Psychiatric illnesses may adversely affect food intake and nutritional status. Also, the drugs used to treat the disorders, including antipsychotics,



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antidepressants, monoamine oxidase inhibitors, and lithium, can affect appetite and gastrointestinal function, and can interact with foods.

- Study of the efficacy and tolerability of L-acetylcarnitine therapy in the senile brain. Bonavita E. *International Journal of Clinical Pharmacology, Therapy, and Toxicology*, 1986 Sep, 24(9):511-6.

A double-blind, placebo-controlled study showed that treatment with L-acetylcarnitine can improve the mental abilities of senile patients.

- The biology of folate in depression: implications for nutritional hypotheses of the psychoses. Abou-Saleh MT; Coppen A. *Journal of Psychiatric Research*, 1986, 20(2):91-101.

Folate deficiency is common in psychiatric disorders, particularly depression. This deficiency – with or without deficiencies of other nutritional factors – may predispose people to psychiatric disturbances, or may worsen existing conditions.

- Zinc in depressive disorder. McLoughlin IJ; Hodge JS. *Acta Psychiatrica Scandinavica*, 1990 Dec, 82(6):451-3.

Levels of zinc in the blood of patients admitted to a hospital for depression were lower than those in a control group. Upon release from the hospital after treatment, the patients' zinc levels had gone up significantly.

Eating Disorders

- Anorexia nervosa responding to zinc supplementation: a case report. Yamaguchi H; Arita Y; Hara Y; Kimura T; Nawata H. *Gastroenterologia Japonica*, 1992 Aug, 27(4):554-8.

Zinc supplementation may be a therapeutic option in anorexia. In an anorexic patient with a low zinc level, supplementary zinc was given. The patient's digestive symptoms disappeared, and she regained normal weight.

- Oral zinc supplementation in anorexia nervosa. Safai-Kutti S. *Acta Psychiatrica Scandinavica*. Supplementum, 1990, 361:14-7.

There is evidence to suggest that zinc deficiency is a causative factor in anorexia nervosa. Anorexic patients receiving zinc supplementation showed weight gain. The design of a placebo-controlled study of zinc supplementation in anorexia is described.

- Treatment of childhood anorexia with spleen deficiency by Qiang Zhuang Ling. Zou ZW; Li XM. *Journal of Traditional Chinese Medicine*, 1989 Jun, 9(2):100-2.

The traditional Chinese herbal prescription Qiang Zhuang Ling was used to treat a group of patients suffering from childhood anorexia with spleen deficiency. The therapeutic effect of the herbs was significantly greater than that seen in another group of patients treated with a zinc sulphate solution.

- Zinc deficiency and childhood-onset anorexia nervosa. Lask B; Fosson A; Rolfe U; Thomas S. *Journal of Clinical Psychiatry*, 1993 Feb, 54(2):63-6.

Zinc deficiency was found to be common in childhood-onset anorexia nervosa.

- Zinc status in anorexia nervosa. Varela P; Marcos A; Navarro MP. *Annals of Nutrition and Metabolism*, 1992, 36(4):197-202.

The body's zinc-dependent functions may be impaired in anorexia nervosa as a consequence of zinc unavailability.

Hyperkinesia

- Developmental effects of vitamin B-6 restriction on the locomotor behavior of rats. Guilarte TR; Miceli RC; Moran TH. *Brain Research Bulletin*, 1991 Jun, 26(6):857-61.

Newborn rats on a vitamin-B-6-restricted diet were less active than those in a control group. However, when the vitamin-B-6-deprived rats got older, they became hyperactive. Long-term B-6 deprivation seems to result in damage to the nerve systems associated with locomotor behavior.

- Neonatal hyperexcitability in relation to plasma ionized calcium, magnesium, phosphate and glucose. Nelson N; Finnstrom O; Larsson L. *Acta Paediatrica Scandinavica*, 1987 Jul, 76(4):579-84.

Newborn, full-term babies who seemed hyperactive at birth were shown to have low magnesium levels. The levels normalized spontaneously at 5 days of age.

- Vitamin B12 improves cognitive disturbance in rodents fed a choline-deficient diet. Sasaki H; Matsuzaki Y; Meguro K; Ikarashi Y; Maruyama Y; Yamaguchi S; Sekizawa K. *Pharmacology, Biochemistry and Behavior*, 1992 Oct, 43(2):635-9.

Rats on a choline-deficient diet were less able to learn than rats on a choline-enriched diet. However, when the choline-deficient diet was supplemented with vitamin B12, there were no differences in learning ability between the groups.

- Subtle abnormalities of gait detected early in vitamin B6 deficiency in aged and weanling rats with hind leg gait analysis. Schaeffer MC; Cochary EF; Sadowski JA. *Journal of the American College of Nutrition*, 1990 Apr, 9(2):120-7.

Motor abnormalities have been observed in every species made vitamin-B6-deficient. In rats, a deficiency of the vitamin is reflected in an abnormal gait at 2-3 weeks of age.

Insomnia

- Double blind study of a valerian preparation. Lindahl O; Lindwall L. *Pharmacology, Biochemistry and Behavior*, 1989 Apr, 32(4):1065-6.

A valerian root preparation was compared with a placebo in a double-blind test of its sedative effects. It showed significant effectiveness in improving sleep, and no side effects were observed.

- Neuropsychopharmacologic properties of a Schumannophyton problematicum root extract. Amadi E; Offiah NV; Akah PA. *Journal of Ethnopharmacology*, 1991 May-Jun, 33(1-2):73-7.

An extract of Schumannophyton problematicum, a plant popular among Nigerian native healers for the treatment of psychosis, was given to mice. The extract, which appears to depress the central and autonomic nervous systems, can inhibit hyperactivity caused by amphetamines, induce passivity, and prolong sleeping time induced by the tranquilizer pentobarbital.

- Neurotropic action of the hydroalcoholic extract of *Melissa officinalis* in the mouse. Soulamani R; Fleurentin J; Mortier F; Misslin R; Derrieu G; Pelt JM. *Planta Medica*, 1991 Apr, 57(2):105-9.

An extract of *Melissa officinalis* was tested in mice and shown to have sedative properties at low doses, and pain-relieving and sleep-inducing properties at higher doses.

- Panax ginseng extract modulates sleep in unrestrained rats. Rhee YH; Lee SP; Honda K; Inoue S. *Psychopharmacology*, 1990, 101(4):486-8.

Panax ginseng extract was found to enhance the amount of slow-wave sleep in rats.

- Parasomnias (non-epileptic nocturnal episodic manifestations) in patients with magnesium deficiency. Popoviciu L; Delast-Popoviciu D; Delast-Popoviciu R; Bagathai I; Bicher G; Buksa C;

Covaciu S; Szalay E. *Romanian Journal of Neurology and Psychiatry*, 1990 Jan-Mar, 28(1):19-24.

Severe sleep disorders, such as night terrors, may be linked to brain damage caused by magnesium deficiency.

- Pharmacological investigations on Achyrocline satureioides (LAM.) DC., Compositae. Simoes CM; Schenkel EP; Bauer L; Langeloh A. *Journal of Ethnopharmacology*, 1988 Apr, 22(3):281-93.

Among the therapeutic properties of Achyrocline satureioides (Lam.) DC. is its sleep-enhancing effect, which was shown in mice.

- Potassium affects actigraph-identified sleep. Drennan MD; Kripke DF; Kleinfuss HA; Moore JD. *Sleep*, 1991 Aug, 14(4):357-60.

A double-blind, placebo-controlled study with normal young males on a low-potassium diet showed that potassium supplements may increase sleep efficiency, lessening the frequency of wakefulness immediately after the onset of sleep.

- Preliminary psychopharmacological evaluation of Ocimum sanctum leaf extract. Sakina MR; Dandiya PC; Hamdard ME; Hameed A. *Journal of Ethnopharmacology*, 1990 Feb, 28(2):143-50.

An extract of the leaves of Ocimum sanctum was shown in mice to have a sedative effect.

- Psychotropic effects of Japanese valerian root extract. Sakamoto T; Mitani Y; Nakajima K. *Chemical and Pharmaceutical Bulletin*, 1992 Mar, 40(3):758-61.

Valerian extract, which acts on the central nervous system, was shown to prolong drug-induced sleep in mice. The extract may also be an antidepressant.

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- Treatment of persistent sleep-wake schedule disorders in adolescents with methylcobalamin (vitamin B12). Ohta T; Ando K; Iwata T; Ozaki N; Kayukawa Y; Terashima M; Okada T; Kasahara Y. *Sleep*, 1991 Oct, 14(5):414-8.

Two adolescents suffering from persistent sleep-wake rhythm disorders were helped by treatment with vitamin B12, although neither had shown evidence of B12 deficiency, or of hypothyroidism, which can cause deficiency.

- Vitamin B12 treatment for sleep-wake rhythm disorders. Okawa M; Mishima K; Nanami T; Shimizu T; Ijima S; Hishikawa Y; Takahashi K. *Sleep*, 1990 Feb, 13(1):15-23.

Patients with sleep-wake schedule disorders were helped by daily administration of vitamin B12. (Blood levels of the vitamin were within the normal range before treatment.)

- Neuro-depressive properties of essential oil of lavender. Delaveau P; Guillemain J; Narcisse G; Rousseau A. *Comptes Rendus des Seances de la Societe de Biologie et de Sesfiliales*, 1989, 183(4):342-8.

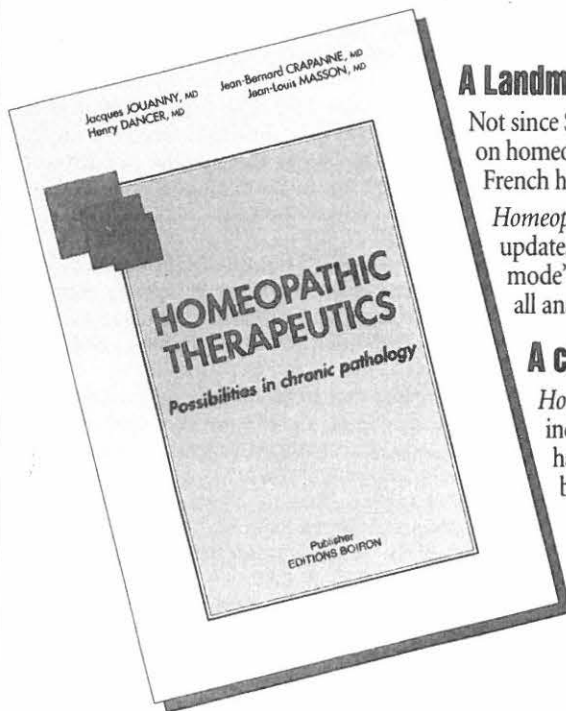
Essential oil of lavender given to mice relieves anxiety and prolongs drug-induced sleeping time, although only for the first five days it is administered.

- Neurodepressive effects of the essential oil of *Lavandula angustifolia* Mill. Guillemain J; Rousseau A; Delaveau P. *Annales Pharmaceutiques Francaises*, 1989, 47(6):337-43.

Oil of lavender given to mice produced a sedative effect.

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Nutrition & Mental Illness

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- Quality of *Schisandra incarnata* Stapf. Song W. Chung-Kuo Chung Yao Tsa Chih *China Journal of Chinese Materia Medica*, 1991 Apr, 16(4):204-6, 253.

The medicinal plant *Schisandra incarnata* has sleep-enhancing properties.

Learning Disorders and Dyslexia

- Learning and memory disabilities in young adult rats from mildly zinc deficient dams. Halas ES; Hunt CD; Eberhardt MJ. *Physiology and Behavior*, 1986, 37(3):451-8.

Rats whose mothers had had a mildly zinc-deficient diet during pregnancy and lactation were shown to have a learning deficit in that their short-term memory was impaired.

- The effects of acetyl-L-carnitine on experimental models of learning and memory deficits in the old rat. Valerio C; Clementi G; Spadaro F; D'Agata V; Raffaele R; Grassi M; Lauria N; Drago F. *Functional Neurology*, 1989 Oct-Dec, 4(4):387-90.

Aged rats, which generally have impaired learning and memory capacity, were treated with acetyl-L-carnitine. They showed significant improvement in these areas.

Organic Mental Disorders

- Acetyl-L-carnitine in the treatment of mildly demented elderly patients. Passeri M; Cucinotta D; Bonati PA; Iannuccelli M; Parnetti L; Senin U. *International Journal of Clinical Pharmacology Research*, 1990, 10(1-2):75-9.

In a double-blind study, acetyl-L-carnitine, which acts to alleviate defects in nerve signals, was shown to help mildly demented elderly patients in the areas of behavior, memory, attention, and verbal fluency.

- Acute organic psychosis caused by thyrotoxicosis and vitamin B12 deficiency: case report. Lassen E; Ewald H. *Journal of Clinical Psychiatry*, 1985 Mar, 46(3):106-7.

A patient developed an acute psychosis due to a deficiency of thyroid hormone and vitamin B12. Replacement of thyroid hormone and B12 corrected the condition.

- Alterations in calcium content and biochemical processes in cultured skin fibroblasts from aged and Alzheimer donors. Peterson C; Goldman JE. *Proceedings of the National Academy of Sciences of the United States of America*, 1986 Apr, 83(8):2758-62.

Calcium balance and certain functions within cells are altered in both aging and Alzheimer's disease, but they are altered more in Alzheimer's than in normal aging.

- Biological effects of aging on bone and the central nervous system. Fujita T. *Experimental Gerontology*, 1990, 25(3-4):317-21.

The most common diseases of the elderly are osteoporosis and senile dementia. These conditions may be related in that abnormalities of calcium metabolism affect both the skeletal and nervous systems.

- Cerebral atrophy and hypoperfusion improve during treatment of Wernicke-Korsakoff syndrome. Meyer JS; Tanahashi N; Ishikawa Y; Hata T; Velez M; Fann WE; Kandula P; Mortel KF; Rogers RL. *Journal of Cerebral Blood Flow and Metabolism*, 1985 Sep, 5(3):376-85.

Early recognition and treatment of Wernicke-Korsakoff syndrome improves patients' cognitive and neurological impairments rapidly. Treatment includes alcohol withdrawal, nutritious diet, and thiamine supplements.

- Clinical signs in the Wernicke-Korsakoff complex: a retrospective analysis of 131 cases diagnosed at necropsy. Harper CG; Giles M; Finlay-Jones R. *Journal of Neurology, Neurosurgery and Psychiatry*, 1986 Apr, 49(4):341-5.

Alcoholics are at risk of Wernicke-Korsakoff syndrome, which often goes undiagnosed. Repeated episodes of vitamin B1 deficiency may be the cause of the syndrome, and alcoholics should be monitored for this.

- Cytosolic free calcium and cell spreading decrease in fibroblasts from aged and Alzheimer donors. Peterson C; Ratan RR; Shelanski ML; Goldman JE. *Proceedings of the National Academy of Sciences of the United States of America*, 1986 Oct, 83(20):7999-8001.

At the cellular level, Alzheimer's disease is not just a cerebral disease, but a systemic one: Alterations in calcium regulation are found throughout the body. These alterations are found in normal elderly people as well, but not to the same extent as in Alzheimer's patients. Some of the cellular changes in Alzheimer's patients can be partially reversed by treatment with a form of calcium.

- Disappearance of high-incidence amyotrophic lateral sclerosis and parkinsonism-dementia on Guam. Garruto RM; Yanagihara R; Gajdusek DC. *Neurology*, 1985 Feb, 35(2):193-8.

Nutritional deficiencies of calcium and magnesium, with resultant deposition of calcium and aluminum in neurons, may have been factors in the high rates of amyotrophic lateral sclerosis and parkinsonism-dementia that occurred several decades ago among the Chamorros of Guam.

- Efficacy and clinical relevance of cognition enhancers. Herrmann WM; Stephan K. *Alzheimer Disease and Associated Disorders*, 1991, 5 Suppl 1:S7-12.

The cognition-enhancers piracetam, acetyl-L-carnitine, and nimodipine are more effective than placebos in improving the mental functioning of patients suffering from Alzheimer's and other age-related dementias.

- Neurochemical hypothesis: participation by aluminum in producing critical mass of colocalized errors in brain leads to neurological disease. Joshi JG. *Comparative Biochemistry and Physiology. C:Comparative Pharmacology*, 1991, 100(1-2):103-5.

Aluminum interferes with metabolism of glucose and of iron, as well as other functions. Metabolic errors induced by aluminum in specific areas of the brain to which the metal can be transported may lead to neurological disorders.

- Neuropsychiatric aspects of trace elements. Linter CM. *British Journal of Hospital Medicine*, 1985 Dec, 34(6):361-5.

Trace elements may be causative or therapeutic factors in a wide range of illnesses. Knowledge of trace element metabolism has increased dramatically in the past decade.

- Neuropsychiatric disorders caused by cobalamin deficiency in the absence of anemia or macrocytosis. Lindenbaum J; Heaton EB; Savage DG; Brust JC; Garrett TJ; Podell ER; Marcell PD; Stabler SP; Allen RH. *New England Journal of Medicine*, 1988 Jun 30, 318(26):1720-8.

Neuropsychiatric disorders due to cobalamin deficiency occur commonly in the absence of anemia. Cobalamin therapy is helpful in reducing neuropsychiatric abnormalities in these cases.

- Neuropsychological changes in demented patients treated with acetyl-L-carnitine. Sinforiani E; Iannuccelli M; Mauri M; Costa A; Merlo P; Bono G; Nappi G. *International Journal of Clinical Pharmacology Research*, 1990, 10(1-2):69-74.

Patients suffering mild to moderate dementia were treated with acetyl-L-carnitine or piracetam. Significant improvement was shown in the acetyl-L-carnitine group – but not in the piracetam group – in the areas of behavior, attention, and psychomotor performance.

Nutrition & Mental Illness

- Pathological brain ageing: evaluation of the efficacy of a pharmacological aid. Guarnaschelli C; Fugazza G; Pistarini C. *Drugs under Experimental and Clinical Research*, 1988, 14(11):715-8.

L-acetylcarnitine given to aged patients was shown to be effective in enhancing cognitive ability, motor activity, and self-sufficiency, and in relieving depression.

- Pernicious anemia in the demented patient without anemia or macrocytosis. A case for early recognition. Gross JS; Weintraub NT; Neufeld RR; Libow LS. *Journal of the American Geriatrics Society*, 1986 Aug, 34(8):612-4.

Pernicious anemia in elderly patients suffering from dementia can occur in the absence of anemia. Treatment with vitamin B12 has a therapeutic effect.

- Pharmaco-electroencephalographic and clinical effects of the cholinergic substance - acetyl-L-carnitine - in patients with organic brain syndrome. Hermann WM; Dietrich B; Hiersemenzel R. *International Journal of Clinical Pharmacology Research*, 1990, 10(1-2):81-4.

Acetyl-L-carnitine is promising as a treatment for elderly patients with impaired brain function, as shown in two double-blind, placebo-controlled studies. Side effects were not generally seen.

- Pyridoxine, ascorbic acid and thiamine in Alzheimer and comparison subjects. Agbayewa MO; Bruce VM; Siemens V. *Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie*, 1992 Nov, 37(9):661-2.

A group of patients with Alzheimer's disease showed lower functional levels of vitamin B1 than those of a group of normal subjects.

- Reduced gastrointestinal absorption of calcium in dementia. Ferrier IN; Leake A; Taylor GA; McKeith IG; Fairbairn AF; Robinson CJ; Francis RM; Edwardson JA. *Age and Ageing*, 1990 Nov, 19(6):368-75.

Patients suffering from Alzheimer-type dementia and multi-infarct dementia showed reduced ability to absorb calcium intestinally.

- Relationship of normal serum vitamin B12 and folate levels to cognitive test performance in subtypes of geriatric major depression. Bell IR; Edman JS; Miller J; Hebben N; Linn RT; Ray D; Kayne HL. *Journal of Geriatric Psychiatry and Neurology*, 1990 Apr-Jun, 3(2):98-105.

Elderly patients with psychotic depression were assessed for vitamin B12 and folate levels. Those with higher B12 levels tended to do better on measures of cognitive ability. Metabolic factors, including B12, may play specific roles in psychiatric disorders of the elderly.

Premenstrual Syndrome

- Assessment of magnesium status. Elin RJ. *Clinical Chemistry*, 1987 Nov, 33(11):1965-70.

Assessing the magnesium status of an individual is difficult. Most data are taken from blood tests, yet most of the magnesium in the body is in bone and soft tissues. A better understanding of magnesium transport and metabolism is needed, as changes in magnesium status have been implicated in a number of conditions, including heart conditions, high blood pressure, and premenstrual syndrome.

- Calcium supplementation in premenstrual syndrome: a randomized crossover trial. Thys-Jacobs S; Ceccarelli S; Bierman A; Weisman H; Cohen MA; Alvir J. *Journal of General Internal Medicine*, 1989 May-Jun, 4(3):183-9.

In a double-blind study, daily calcium supplementation was given to women suffering from premenstrual syndrome. The

calcium was shown to be an effective treatment for premenstrual symptoms, including water retention and pain. It also alleviated menstrual pain.

- Clinical and biochemical effects of nutritional supplementation on the premenstrual syndrome. Stewart A. *Journal of Reproductive Medicine*, 1987 Jun, 32(6):435-41.

A study of women with premenstrual syndrome showed frequent nutritional deficiencies, particularly of vitamin B6 and magnesium. A multivitamin and mineral supplement corrected some of the deficiencies and improved the symptoms of premenstrual tension.

- Controlled trial of pyridoxine in the premenstrual syndrome. Williams MJ; Harris RI; Dean BC. *Journal of International Medical Research*, 1985, 13(3):174-9.

Pyridoxine, compared with a placebo, was effective in alleviating premenstrual symptoms.

- Effect of a nutritional supplement on premenstrual symptomatology in women with premenstrual syndrome: a double-blind longitudinal study. London RS; Bradley L; Chiamori NY. *Journal of the American College of Nutrition*, 1991 Oct, 10(5):494-9.

Nutritional supplements proved more effective than a placebo in relieving premenstrual syndrome.

- Efficacy of alpha-tocopherol in the treatment of the premenstrual syndrome. London RS; Murphy L; Kitlowski KE; Reynolds MA. *Journal of Reproductive Medicine*, 1987 Jun, 32(6):400-4.

Daily alpha-tocopherol supplements were shown to be effective in reducing premenstrual symptoms in a double-blind, placebo-controlled study.

- Magnesium and the premenstrual syndrome. Sherwood RA; Rocks BF; Stewart A; Saxton RS. *Annals of Clinical Biochemistry*, 1986 Nov, 23 (Pt 6):667-70.

Women with premenstrual syndrome had significantly lower than normal levels of magnesium in their red blood cells.

- Oral magnesium successfully relieves premenstrual mood changes. Facchinetti F; Borella P; Sances G; Fioroni L; Nappi RE; Genazzani AR. *Obstetrics and Gynecology*, 1991 Aug, 78(2):177-81.

Magnesium supplementation, when compared with a placebo, was effective in relieving premenstrual mood changes.

- Premenstrual and menstrual symptom clusters and response to calcium treatment. Alvir JM; Thys-Jacobs S. *Psychopharmacology Bulletin*, 1991, 27(2):145-8.

Calcium supplementation was shown to alleviate three premenstrual symptoms - mood changes, water retention, and pain - and to relieve menstrual pain.

- Premenstrual syndrome. Tactics for intervention. Havens C. *Postgraduate Medicine*, 1985 May 15, 77(7):32-7.

Nutritional supplements are sometimes appropriate in the treatment of premenstrual syndrome, along with dietary changes, regular exercise, and, at times, diuretics and other drugs. Vitamin B6, and possibly vitamin E or zinc sulfate, may be used.

- Pyridoxine (vitamin B6) and the premenstrual syndrome: a randomized crossover trial. Doll H; Brown S; Thurston A; Vessey M. *Journal of the Royal College of General Practitioners*, 1989 Sep, 39(326):364-8.



Nutrition & Mental Illness

In a double-blind, placebo-controlled study, vitamin B6 supplementation was shown to be effective in alleviating emotional symptoms of premenstrual syndrome. Depression, irritability, and tiredness were reduced in women taking B6.

- Pyridoxine in the treatment of premenstrual syndrome: a retrospective survey in 630 patients. Brush MG; Bennett T; Hansen K. *British Journal of Clinical Practice*, 1988 Nov, 42(11):448-52.

Vitamin B6 supplements seemed to be beneficial in alleviating premenstrual symptoms, according to a retrospective study. No side effects of the treatment were reported.

Schizophrenia

- Acetazolamide and thiamine: an ancillary therapy for chronic mental illness. Sacks W; Esser AH; Feitel B; Abbott K. *Psychiatry Research*, 1989 Jun, 28(3):279-88.

Treatment of chronic schizophrenic patients with the drug acetazolamide, plus thiamine, was shown to be effective on a number of assessment scales. No untoward effects were seen for this therapy.

- Enhancement of recovery from psychiatric illness by methylfolate. Godfrey PS; Toone BK; Carney MW; Flynn TG; Bottiglieri T; Laundry M.; Chanarin I; Reynolds EH. *Lancet*, 1990 Aug 18, 336(8712):392-5.

One third of a group of psychiatric patients with either major depression or schizophrenia showed signs of folate deficiency, and took part in a double-blind, placebo-controlled study of methylfolate supplementation (in addition to standard treatment). Both depressed and schizophrenic patients showed significantly improved clinical and social recovery with the supplements, and the differences between the outcomes of the methylfolate- and placebo-receiving groups increased over time. These findings add to the evidence that disturbances of methylation in the nervous system may be a factor in some forms of mental illness.

- Plasma levels and urinary vitamin C excretion in schizophrenic patients. Suboticanec K; Folnegovic-Smalc V; Turcin R; Mestrovic B; Buzina R. *Human Nutrition. Clinical Nutrition*, 1986 Nov, 40(6):421-8.

Schizophrenia may be associated with impaired ascorbic acid metabolism. Schizophrenic patients were shown to have lower vitamin C levels than those of a nonschizophrenic group of psychiatric patients that had been on the same hospital diet as the schizophrenics for at least 2 months. Even when the schizophrenics were given vitamin C supplements to raise their levels to those of the other group, they excreted less of the vitamin in their urine.

- Pyridoxine improves drug-induced parkinsonism and psychosis in a schizophrenic patient. Sandyk R; Pardeshi R. *International Journal of Neuroscience*, 1990 Jun, 52(3-4):225-32.

Pyridoxine supplementation should be considered in psychiatric patients with drug-induced movement disorders, such as Parkinsonism and tardive dyskinesia. An underlying pyridoxine deficiency in these patients may increase the risk of these drug-induced disorders, as well as worsen psychotic behavior. The effects of pyridoxine on movement disorders, and on psychosis, seem related to its enhancing serotonin and melatonin functions.

- Subacute combined degeneration of the spinal cord due to folate deficiency in association with a psychotic illness. Donnelly S; Callaghan N. *Irish Medical Journal*, 1990 Jun, 83(2):73-4.

A dietary deficiency of folic acid in a psychotic patient caused spinal cord degeneration. Treatment with folic acid relieved this problem significantly, and may have contributed to an improvement in the patient's psychiatric illness.

- The biology of folate in depression: implications for nutritional hypotheses of the psychoses. Abou-Saleh MT; Coppen A. *Journal of Psychiatric Research*, 1986, 20(2):91-101.

Folate deficiency is common in psychiatric disorders, particularly in depressive illness. Alcoholic, lithium-treated, and anorexic patients are often folate-deficient. Folate deficiency – with or without deficiencies of other nutritional factors – may predispose people to psychiatric disturbances, or aggravate existing disturbances.

- Unification of the findings in schizophrenia by reference to the effects of gestational zinc deficiency. Andrews RC. *Medical Hypotheses*, 1990 Feb, 31(2):141-53.

It is hypothesized that schizophrenia is caused by the action of gestational zinc deficiency – which may or may not be caused by diet – on genetically susceptible fetuses. A nongenetic but nevertheless transmissible immune defect may play a role in this disorder.

Direct Correspondence to the Townsend Letter

Gary Null, Ph.D. has 50 published books on health and nutrition as well as numerous articles published in leading magazines. He is the publisher of the *Natural Living Newsletter*, a monthly publication on health and nutrition. Null is host and health and science reporter on the nationally syndicated Gary Null Show on WBAI. Dr. Null holds a B.S. in human nutrition from Edison State College and Ph.D. in human nutrition and public health science from the Union Graduate School. Dr. Null's investigative reporting has won prestigious awards. To listen to Gary Null's weekly Saturday/Sunday program in your area, call Virtual Network at 800-USA-1718.

