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On the Orthomolecular Environment of the Mind: Orthomolecular Theory

John

38-48 minutes

Vital Information Suppressed

Every week I get calls from people interested in learning more about how I recovered from schizophrenia via orthomolecular medicine. I refer everyone to Well Mind Assoc of Greater Washington for more info at 301-949-8282. Also check out http://www.orthomed.org/ There are many good links from that site including one to Dr.Hoffer's homepage at http://www.islandnet.com/~hoffer/hofferhp.htm

It saddens me greatly that this information is being suppressed. Please forward it widely. Far too much needless suffering is going on. Twenty years after I recovered people are still being denied access to orthomolecular treatment, which was first made available way back in 1952. Due to the suppression of this information, I was forced to spend 4 years in mainstream mental hospitals where they almost killed me with drugs and really came close a few times. I almost choked to death on my own saliva once because phenothiazine medication causes you to lose your gag reflex and choke. I had numerous bloody fights with the goons. The evil of the pharma cartel is incalculable. The Nazis who are suppressing this information are the same Nazis who are using Codex to try to destroy our access to the supplements we need.

On the Orthomolecular Environment of the Mind: Orthomolecular Theory

"Varying the concentrations of substances normally present in the human body may control mental disease." - Linus Pauling

"The methods principally used now for treating patients with mental disease are psychotherapy (psychoanalysis and related efforts to provide insight and to decrease environmental stress), chemotherapy (mainly with the use of powerful synthetic drugs, such as chlorpromazine, or powerful natural products from plants, such as reserpine), and convulsive shock therapy (electroconvulsive therapy, insulin coma therapy, pentylenetetrazol shock therapy). I have reached the conclusion that another general method of treatment, which may be called orthomolecular therapy, may be found to be of great value, and may turn out to be the best method of treatment for many patients." - Linus Pauling, Science, April 19, 1968, p. 265

The author defines orthomolecular psychiatry as the achievement and preservation of good mental health by the provision of the optimum molecular environment for the mind, especially the optimum concentrations of substances normally present in the human body, such as the vitamins. He states that there is sound evidence for the theory that increased intake of such vitamins as ascorbic acid, niacin pyridoxine, and cyanocobalamin is useful in treating schizophrenia. The negative conclusions of APA Task Force Report 7, Megavitamin and Orthomolecular Therapy in Psychiatry, he says, result not only from faulty arguments and from a bias against megavitamin therapy but also from a failure to deal fully with orthomolecular therapy in psychiatry- Three psychiatrists comment on Dr. Pauling's presentation.

Orthomolecular psychiatry is the achievement and preservation of mental health by varying the concentrations in the human body of substances that are normally present, such as the vitamins- It is part of a broader subject, orthomolecular medicine, an important put because the functioning of the brain

is probably more sensitively dependent on its molecular composition and structure than is the functioning of other organs (1) . After having worked for a decade on the hereditary hemolytic anemias, I decided in 1954 to work on the molecular basis of mental disease. I read the papers and books dealing with megavitamin therapy of schizophrenia by Hoffer and Osmond (2,4) as well as the reports on studies of vitamins in relation to mental disease by Cleckley and Sydenstricker (5,6) and others. In the course of time I formulated a general theory of the dependence of function on molecular structure of the brain and other parts of the body and coined the adjective "orthomolecular" to describe it (1).

There is no doubt that the mind is affected by its molecular environment. The presence in the brain of molecules of LSD, mescaline, or some other schizophrenogenic substance is associated with profound psychic effects. Mental manifestations of avitaminosis have been reported for several vitamins. A correlation of behavior of school children with concentration of ascorbic acid in the blood (increase in "alertness" or "sharpness" with increase in concentration) has been reported by Kubala and Katz (7).

A striking abnormality in the urinary excretion of ascorbic acid after an oral loading dose was reported for chronic schizophrenics by VanderKamp (8) and by Herjanic nd Moss-Herjanic (9). My associates and I (10) carried out loading tests for three vitamins on schizophrenic patients who had recently been hospitalized and an control subjects. The percentage of schizophrenic patients who showed low urinary excretion of each vitamin was about twice as great as that of the controls: for ascorbic acid, 4 percent of the schizophrenic patients showed low urinary excretion versus 32 percent of the controls; for niacinamide, 81 percent versus 46 percent; and for yridoxine, 52 percent versus 24 Percent. The possibility that the low values in urinary excretion of the vitamins for schizophrenic patients resulted from poor nutrition is as unlikely by the observation that the numbers of subjects low in one, two, or all three vitamins corresponded well with the numbers calculated for independent incidence.

There are a number of plausible mechanisms by which the concentration of a vitamin may affect the functioning of the brain. One mechanism, effective COT vitamins hat serve as coenzymes, is that of shifting the equilibrium for the reaction of apoenzyme and coenzyme to give the active enzyme. An example is the effectiveness of yanocobalamin (vitamin B12) given in amounts 1,000 times greater than normal to control the disease methylmalonic aciduria (11-14). About half of the patients with this disease are successfully treated with megadoses of vitamin B12 . In these patients a genetic mutation has occurred and an altered apoenzyme that has a greatly reduced affinity for the coenzyme has been produced. Increase in concentration of the coenzyme can counteract the effect of the decrease in the value of the combining constant and lead to the formation of enough of the active enzyme to catalyze effectively the reaction of conversion of methylmalonic acid to succinic acid.

In the human population there may be several alleles of the gene controlling the manufacture of each apoenzyme; in consequence the concentration of coenzyme needed o produce the amount of active enzyme required for optimum health may well be somewhat different for different individuals- In particular, many individuals may require considerably higher concentration of one Or more coenzymes than other people do for optimum health, especially for optimum mental health. It is difficult to obtain experimental evidence for gene mutations that lead to only small changes in the properties of enzymes. The fact that genes that lead to large and more easily detectable hanges in the properties of enzymes occur, as in individuals with methylmalonic aciduria, for example, suggests that mutations that lead to small changes also occur.

Significant differences in enzyme activity in different individuals have been reported by many investigators, especially by Williams [15], who has made many studies of biochemical individuality. It is likely that thorough studies of enzymes would show them to be similar to the human hemoglobins. A few of the abnormal human hemoglobins, most of which involve only the substitution of one amino-acid residue for another in either the alpha chain or the beta chain of the molecule, differ greatly in properties from normal adult hemoglobin, leading to serious manifestations of disease.

It was in the course of the study of one of these diseases, sickle cell anemia, that the first abnormal hemoglobin was discovered (16). Most of the abnormal human hemoglobins, however. differ from normal hemoglobin in their properties to only a small extent, so that there is no overt manifestation of disease. There is, nevertheless, he possibility that even the small changes in properties of an abnormal hemoglobin associated with a mild hemoglobinopathy will have deleterious consequences. An example is the intolerance to sulfa drugs associated with the substitution of arginine for histidine in the locus 58 in the alpha chain or 63 in the beta chain. It is likely that individual differences in enzyme activity will in the course of time be shown to be the result of differences in the amino-acid sequences of the polypeptide chains of the poenzymes.

More than 100 abnormal human hemoglobins are now known, and the human population may be expected to be similarly complex with respect to many enzymes, including those involved in the functioning of the brain. A tendency to schizophrenia is probably polygenic in origin. I have suggested (1) that the genes primarily involved n this tendency may well be those which regulate the metabolism of vital substances such as the vitamins.

Some vitamins are known to serve as coenzymes for several enzyme systems. We might ask if the high concentration of coenzyme required to produce the optimum mount of one active enzyme might not lead to the production of far too great an amount of another active enzyme. The answer to this question is that the danger is not very great. For most enzymes the concentration of coenzyme and the value of the combination constant are such that most (90 percent or more) of the protein is converted to active enzyme. Accordingly, a great increase in concentration would increase the amount of most active enzymes by only a few percentage points, whereas t might cause a great increase for a mutated enzyme.

The Orthomolecular Treatment of Schizophrenia

In the book Orthomolecular Psychiatry: Treatment Of Schizophrenia (17) my colleagues and I pointed out that the orthomolecular treatment of schizophrenia involves the use of vitamins (megavitamin therapy) and minerals; the control of diet, especially the intake of sucrose; and, during the initial acute phase, the use of conventional methods of controlling the crisis, such as the phenothiazines. The phenothiazines are not, of course, normally present in the human body and are not orthomolecular. However, they are so valuable in controlling the crisis that their use is justified in spite of their undesirable side effects.

Hawkins (18) stated that his initial combination of vitamins for the treatment of schizophrenia was I gin. of ascorbic acid, I gm, of niacinamide, 50 mg. of pyridoxine, and 400 I.U. of vitamin E four times a day. Other vitamins may also be given. A larger intake, especially of niacinamide or niacin may be prescribed; the usual amount seems to be about 8 gm. a day after an initial period on 4 gm. a day.

The vitamins, as nutrients or medicaments, pose an interesting question. The question is not, Do we need them? We know that we do need them, in small amounts, to stay alive. The Teal question is, What daily amounts of the various vitamins will lead to the best of health, both physical and mental? This question has been largely ignored by medical and nutritional authorities.

Let us consider schizophrenia, Osmond (19) stated that about 40 percent of schizophrenics hospitalized for the first time are treated successfully by conventional methods in that they are released and not hospitalized a second time. The conventional treatment fails for about 60 percent in that the patient is not released or is hospitalized again. Conventional treatment includes a decision about vitamin intake. Usually it is decided that the vitamins in the food will suffice or that a multivitamin tablet will also be given. The amounts of ascorbic acid, niacin pyridoxine, and vitamin E may be approximately the daily allowances recommended by the Food and Nutrition Board of the U.S. National Academy of Sciences-National Research Council: 60 mg. of ascorbic acid, 20 mg of niacin 2 mg. of pyridoxine, and 15 I.U. of vitamin E. Is this amount of vitamins correct? Would many schizophrenic patients respond to their treatment better if the decision were made that they should receive 10 or 100 or 500 times as much of some vitamins? What is the optimum intake for these patients? I believe there is much evidence that the optimum intake for schizophrenic patients is much larger than the recommended daily allowances. By the use of orthomolecular methods in addition to the conventional treatment of schizophrenia, the fraction of patients hospitalized for the first time in whom the disease is controlled may be increased from about 40 percent to about 80 percent. (19)

Ascorbic Acid

It was reported by Horwitt in 1942 (20) and by later investigators that schizophrenic patients receiving the usual dietary amounts of ascorbic acid had lower concentrations of ascorbic acid in the blood than people in good health. The loading-test results of VanderKamp (8), Herjanic and Moss-Herjanic (9), and Pauling and associates (10) have been mentioned above. In his discussion of ascorbic acid and schizophrenia Herjanic (21) concluded:

The individual variation of the need for ascorbic acid may turn out to be one of the contributing factors in the development of the illness. Ascorbic acid is an important substance necessary for optimum functioning of many organs. If we desire, in the treatment of mental illness, to provide the "optimum

molecular environment," especially the optimum concentration of substances normally present in the human body (Pauling,. 1968 (1)), ascorbic acid should certainly be included (2).

There is, moreover, a special reason for an increased intake of ascorbic acid by patients with schizophrenia or any other disease for which there is only partial control. About 60 mg. of ascorbic acid a day is enough to prevent overt manifestations of avitaminosis C (scurvy) in most people. However, there are several significant arguments to support the thesis that the optimum intake for most people is 10 to 100 times more than 60 mg. These arguments are summarized in the papers and books of Irwin Stone (22) and myself (23,24). They constitute the theoretical basis for the customary use of about 4 gin. of ascorbic acid a day in the orthomolecular therapeutic and prophylactic treatment of schizophrenia. A significant controlled trial of ascorbic acid in chronic psychiatric patients was reported in 1963 by Milner (25). The study, which was double-blind, was made with 40 chronic male patients: 34 had schizophrenia, 4 had manic-depressive psychosis, and 2 had general paresis. Twenty of the patients, selected at random, received 1 gm. of ascorbic acid a day for three weeks; the rest received a placebo. The patients were checked with the Minnesota Multiphasic Personality Inventory (MMPI) and the Wittenborn Psychiatric Rating Scales (WPRS) before and after the trial. Milner concluded that "statistically significant improvement in the depressive, manic, and paranoid symptoms-complexes, together with an improvement in overall personality functioning, was obtained following saturation with ascorbic acid" (25). He suggested that chronic psychiatric patients would benefit from the administration of ascorbic acid.

We found (10) that of 106 of the schizophrenic patients we studied who had recently been hospitalized in a private hospital, a county-university hospital, or a state hospital, 81 (76 percent) were deficient in ascorbic acid, as shown by the six-hour excretion of less than 17 percent of an orally administered close. Only 27 of 89 control subjects (30 percent) showed this deficiency. Great deficiency (less than 4 percent excreted) was shown by 24 (22 percent) of the schizophrenic subjects and by only 1 (1 percent) of the controls. I have no doubt that many schizophrenic patients would benefit from an increased intake of ascorbic acid. My estimate is that 4 gm. of ascorbic acid a day, in addition to the conventional treatment, would increase the fraction of acute schizophrenics in whom the disease is permanently controlled by about 25 percent, Except for that of Milner (25), no controlled trial of ascorbic acid in relation to schizophrenia has been made, so far as I know.

Niacin and Niacinamide

The requirement of niacin (nicotinic acid) for proper functioning of the brain is well known. The psychosis of pellagra, as well as the other manifestations of this deficiency disease, is prevented by the intake of a small amount of niacin, about 20 mg. a day. In 1939 Cleckley, Sydenstricker, and Geeslin (5) reported the successful treatment of 19 patients with severe psychiatric symptoms with niacin and in 1941 Sydenstricker and Cleckley (6) reported similarly successful treatment of 29 patients with niacin. In both studies, moderately large doses of niacin, 0.3 to 1.5 gm. a day, were given. None of the patients in these studies had physical symptoms of pellagra or any other avitammosis. A decade later, Hoffer and Osmond (2,3) initiated two doubleblind studies of niacin or niacinamide in the treatment of schizophrenia. Another double-blind study was reported by Denson in 1962 (26). In 1964 Hoffer and Osmond (4) reported that a 10-year follow-up evaluation of the patients in their initial studies showed that 75 percent had not required hospitalization, compared with 36 percent of the comparison group, who had not received niacin. Similar estimates have been made by Hawkins (18). There are, however, contradictory statements by other investigators. The question of the weight of the evidence is discussed below in the section on the APA task force report.

Pyridoxine

Pyridoxine, vitamin B6 is used in the treatment of schizophrenia in amounts of 200 to 800 mg. a day by many orthomolecular psychiatrists, Derivatives of this vitamin are known to be the coenzymes for over 50 enzymes, and the chance of a genotype with need for a large intake of the vitamin is accordingly great. There is evidence that pyridoxine is involved in tryptophan-niacin metabolism.

A double-blind placebo-controlled study has been made of pyridoxine and niacin by Ananth, Ban, and Lehmann (27). Their experimental population consisted of 30 schizophrenic patients: 15 were men, 15 were women, their mean age was 41.7 years, and their mean duration of hospitalization was 10.9 years. They were randomly assigned to three treatment groups: 1) the combined treatment group, which received 3 gm. of nicotinic acid a day for 48 weeks and 75 mg. of pyridoxine a day during three 4-week periods; 2) the nicotinic acid group, which received 3 gm. of nicotinic acid a day for 48 weeks and a pyridoxine placebo; and 3) the pyridoxine group, which received 75 mg- of pyridoxine a day during three

4 week periods and a nicotinic acid placebo. In addition, neuroleptic preparations were administered according to clinical requirements for the control of psychopathology. The investigators reported that "of the ten patients in each treatment group, seven improved and three deteriorated in the nicotinic acid group, nine improved and one deteriorated in both the combined treatment group and in the pyridoxine group" (27). They also stated:

Of the three indices of therapeutic effects, global improvement in psychopathology (Brief Psychiatric Rating Scale and Nurses Observation Scale for Inpatient -Evaluation) scores was seen in all three groups: the number of days of hospitalization during the period of the clinical study was lower in both the nicotinic acid and the combined treatment group; and only in the combined treatment group was the daffy average dosage of phenothiazine medication decreased. Thus, improvement in all three indices was noted in the combined treatment group. However, several side effects were observed during the therapeutic trials, indicating that the vitamins used are not completely safe (27).

The investigators reached the conclusion that "on balance, these results suggest that the addition of pyridoxine may potentiate the action of nicotinic acid. Thus pyridoxine seems to be a useful adjunct to nicotinic acid therapy" (27). Hawkins (18) commented on this work in the following way:

The therapeutic effect was demonstrable even though the patients had been hospitalized for an average of 10.9 years, were not on hypoglycemic diets, and the doses of both pyridoxine (75 mg. daily) and vitamin B3 (3 gm. a day) were considerably below the dosages we routinely prescribe (18).

Cyanocobalamin

A deficiency in cyanocobalamin (vitamin B12), whatever its cause, leads to mental illness as well as to such physical manifestations as anemia. The anemia can be controlled by a large intake of folic acid, but the mental illness and neurological damage cannot. A pathologically low concentration of cyanocobalamin in the blood serum has been reported to occur in a much larger percentage of patients with mental illness than in the general population. Edwin and associates (28) determined the amount of vitamin B12 in the serum of every patient over 30 years old admitted to a mental hospital in Norway during a period of one year. Of the 396 patients, 61 (15-4 percent) had a subnormal or pathologically low concentration of vitamin B 12, less than 150 pg. per ml. (the normal range is 150 to 1,300 pg. per ml.). This incidence is 30 times as great as that estimated for the population as a whole. Other investigators have reported similar results and have suggested that a low serum concentration of vitamin B12, whatever its origin, may cause mental illness. In addition, of course, mental illness may accompany some genetic diseases, such as methylmalonic aciduria, which can be controlled only by achieving a serum concentration of cyanocobalamin far greater than normal.

Minerals and Other Vitamins

There is some evidence that mental illness may result from deprivation of or abnormal need for minerals and other vitamins. (See, for example, Pfeiffer, Iliev, and Goldstein (29)). Further work in this field by psychiatrists and biochemists is needed.

The APA Task Force Report

In July 1973 an APA task force of five physicians and one consultant issued a 54-page report titled Megavitamin and Orthomolecular Therapy in Psychiatry (30). In this report the Task Force on Vitamin Therapy in Psychiatry purports to present both theoretical and empirical reasons for completely rejecting the basic concept of orthomolecular psychiatry, which is the achievement and preservation of good mental health by the provision of the optimum molecular environment for the mind, especially the optimum concentrations of substances normally present in the human body.

Some Errors in the Report

It is mentioned in the report that in the treatment program of the orthomolecular psychiatrists "each patient may receive as many as six vitamins in large doses individually determined by the treating physician as well as other psychotropic drugs and hormones whose doses are also individually determined for each patient" (p. 46). The assumption is made by the task force that the optimum intake of vitamins for mental health is the conventional average daily nutritional requirement, with growth and development as the criteria: "In schizophrenia there is apparently an adequate vitamin intake for growth and development until the illness becomes manifest in the teens or early adult life" (p. 40). Mention is made in the report of the well-known genetic diseases with both psychic and somatic manifestations that can be controlled by an intake of a vitamin 100 or 1,000 times the usually recommended daily allowance, but the possibility that less obvious genetic differences could result in an increased individual need for a larger intake of vitamins in order to achieve good mental health, as discussed in my 1968 publication (1)

and in the earlier sections of this paper, is rejected on the basis of arguments that have little value or pertinence. One such argument is the following:

The two theoretical bases adduced by megavitamin proponents for the effectiveness of NA therapy (nicotinic acid as a methyl acceptor and NAD deficiency) are in fact generally incompatible, because NAA [nicotinamide], when functioning as a vitamin, is bound to the remainder of the coenzyme molecule by the nitrogen of its pyridine ring and hence can no longer accept methyl groups. Essentially, then, the two views of NA as a vitamin precursor of NAD and as a methyl acceptor are incompatible, except for the possibility that there is in schizophrenia double deficit - both a vitamin deficiency and a transmethylation defect and that nicotinic acid has the happy fortune to serve two purposes simultaneously (pp. 40-42).

There is an obvious error in this task force argument. There is no incompatibility between two functions of nicotinic acid; some molecules may engage in one function and others in the other. A defect in either function might be controlled by increasing the intake of the vital substance. A "double deficit" is not needed. The authors of the report would have won the fallacy in their argument if they had set up some equilibrium and reaction rate equations, as was done in my 1968 paper (1). The task force expresses an interesting misunderstanding of the nature of vitamins, in the following words: "By common definition a vitamin is not only an essential nutrient, but it is essential because it is transformed into a coenzyme vital for metabolic reactions" (p. 41). In fact, this is not the common definition of a vitamin; it is wrong. Some vitamins, including vitamin C, are not known to be transformed into a coenzyme. This misunderstanding by the task force may have contributed to the misinterpretation of the evidence for and the theoretical basis of orthomolecular psychiatry. Nicotinic acid as a methyl acceptor is referred to in the report: "From Study No. 12: nicotinic acid in the dosage of 3000 mg. per day can neither prevent nor counteract the psychopathology induced by the combined administration of a monoamine oxidase inhibitor (tranylcypromine) and methionine" (p. 16). In fact, the molecular weights of nicotinic acid and methionine (a methyl donor) are nearly the same, 123 and 149, respectively. Instead of 3 gm., 16.5 gm. of nicotinic acid would have had to be given each day to accept the methyl groups donated by the 20 gm. of methionine that was given each day. The study referred to as number 12 (31), which resulted in an exacerbation of the illness of 30 schizophrenic patients who participated in it, has no value as a test of the methyl acceptor theory of nicotinic acid. Consideration of ethical principles may have kept the investigators from repeating the study with use of the proper equimolar amounts of nicotinic acid and methionine.

The Failure To Discuss Ascorbic Acid and Pyridoxine

In several places the APA task force report mentions the use of 1 to 30 gm. of ascorbic acid a day by orthomolecular psychiatrists. There are, however, no references to the literature. Milner's double-blind study (25) is not mentioned, nor is there any discussion of the many papers in which a low level of ascorbic acid in the blood of schizophrenics was reported. Neither the general theory of orthomolecular psychiatry, as presented in my 1968 paper (1) nor any of the special arguments about the value of ascorbic acid is presented or discussed in any significant way. There is, moreover, no discussion in the report of pyridoxine and no reference to the 1973 work by Ananth, Ban, and Lehmann (27) on the potentiation by pyridoxine of the effectiveness of niacin in controlling chronic schizophrenia. The title of the report, Megavitamin and Orthomolecular Therapy in Psychiatry, is completely inappropriate, and the general condemnation of megavitamin and orthomolecular therapy is unjustified.

Niacin

The report does my that it is possible that the other watersoluble vitamins will prove to be more effective than niacin but it adds;

Nonetheless, the massive use of niacin has always been the cornerstone of the theory and practice of megavitamin advocates. Since this has proved to have no value when is it employed as the sole variable along with conventional treatments of schizophrenia, the burden of proof for the complex and highly individualized programs now advocated would appear to be on the proponents of such treatment (p. 46).

I shall point out below that the principles of medical ethics prevent orthomolecular psychiatrists from withholding from half of their patients a treatment that they consider to be valuable. Controlled tests can be carried out only by skeptics. I now ask whether the task force is justified in saying that the massive use of niacin has been proved to have no value when it is employed as the sole variable along with conventional treatments of schizophrenia. My answer to this question, from a study of the evidence quoted in the report, is that it is not justified. The evidence that niacin has no value is far from conclusive. A beneficial effect of niacin or niacinamide was reported for three double-blind studies (two by Hoffer and Osmond and their collaborators (2,3,32) and one by Denson (26)) and in 12 open clinical trials by other

investigators referred to in the report. On the other hand, the report mentions 7 doubleblind studies in which a statistically significant difference between the niacinamide subjects and the controls was not observed.

A failure to reject with statistical significance the nun hypothesis that the treatment and the placebo have equal value is not proof that the treatment has no value. The explicit statistical analysis of an alternative hypothesis should be carried out: for example, the hypothesis that there is a 10-percent or 20-percent greater improvement in the treated subjects than in the placebo subjects. No such analysis has been published. In fact, some of the "negative" studies indicate that the treatment has value. The report states that "Greenbaum (33) reported a double-blind study of 57 schizophrenic children who received nicotinamide 1 gm. per 50 lbs of body weight or placebo for six months. No statistically significant differences were seen in the two groups as a result of the treatment" (P. 11). it is true that no statistically significant differences were wen, but that is not the whole truth, The principal criterion of improvement in this study was the increase in the score on a clinical scale of observable behavior categories. The average improvement in the score of the 17 children receiving niacinamide was 4.0 units and that of the 24 controls was 2.6 units (there was a third group of 16 children who were given a tranquilizer and niacinamide). The children who were given niacinamide showed a 54-percent greater improvement than the children who were given placebo. The groups were too small, however, for the difference to be significant at the 95-percent level of confidence. This study does not prove that niacinamide has no value. Rather, it indicates that niacinamide has greater value than the placebo, even though it fails to show this at the customary level of statistical significance.

The Hoffer-Osmond Diagnostic Test

Two-thirds of the report relates to niacin and one-third to the Hoffer-Osmond Diagnostic Test (HOD) (34), which has no special connection with megavitamin or orthomolecular psychiatry except that it was devised by the originators of niacin therapy. The report should have been given the- title Niacin Therapy and the HOD Test, or published as two reports, one on niacin and one on the HOD test. It would have been still better for the task force to have discussed megavitamin and orthomolecular therapy in psychiatry fully.

The Question of Controlled Experiments

The report refers to the low credibility of the megavitamin proponents, whose published results were not duplicated in studies carried out by one of the task force members (p. 48). The penultimate sentence of the report is, "Their credibility is further diminished by the consistent refusal over the past decade to perform controlled experiments and to report their new results in a scientifically acceptable fashion" (p. 48). I have talked with the leading orthomolecular psychiatrists and have found that they feel the principles of medical ethics prevent them from carrying out controlled clinical tests, with half of their patients receiving orthomolecular therapy in addition to the conventional treatment and the other half receiving only the conventional treatment. It is the duty of the physician to give to every one of his patients the treatment that in his best judgment will be of the greatest value, Some psychiatrists, including Hoffer and Osmond, carried out controlled trials 20 years ago. They became convinced that orthomolecular therapy, along with conventional treatment, was beneficial to almost every patient. From that time on their ethical principles have required that they give this treatment and not withhold it from half of their patients. The task force is wrong in criticizing the orthomolecular psychiatrists for not having carried out controlled clinical trials during the last few years. Instead, it is the critics, who doubt the value of orthomolecular methods, who are at fault in not having carried out well-designed clinical tests. It is also the duty of a physician to give to a patient a treatment that may benefit him and is known not to be harmful. The incidences of toxicity and other serious side effects of the doses of vitamins used in orthomolecular medicine are low. There is significant evidence that an increased intake of certain vitamins may benefit the patient. It is accordingly the duty of the psychiatrist to prescribe these vitamins for him.

The Bias of the Task Force

The last sentence of the report reads as follows:

Under these circumstances this Task Force considers the massive publicity which they promulgate via radio, the lay press and popular books, using catch phrases which are really misnomers like "megavitamin therapy" and "orthomolecular treatment," to be deplorable (p. 48).

This sentence, like others in the report, shows the presumably unconscious bias of the task force. "Promulgate" (misused here) is a pejorative word, and "catch phrases" is a pejorative expression. I do not understand why megavitamin therapy and orthomolecular treatment should be called misnomers.

This concluding sentence, like many others in the book, seems to me to have been written in order to exert an unjustifiably unfavorable influence on the readers of the report. I have written two popular books, No More War! (35) and Vitamin C and the Common Cold (24). I feel that each of them was worthwhile and that neither would have been easily replaced by a more technical book. The second book (24) was written because I had discovered in reading the medical literature that there was much evidence there about the value of ascorbic acid in decreasing both the incidence and the severity of the common cold and that this evidence had been suppressed or misrepresented by the medical and nutritional authorities. Since publication of the book, eight new studies have been reported. Every one of these has verified the value of ascorbic acid. The APA report shows the same sort of negative attitude as that shown by the authorities toward ascorbic acid in relation to the common cold. There seems to be a sort of professional inertia that hinders progress.

Conclusions

Orthomolecular psychiatry is the achievement and preservation of good mental health by the provision of the optimum molecular environment for the mind, especially the optimum concentrations of substances normally present in the human body, such as the vitamins. There is evidence that an increased intake of some vitamins, including ascorbic acid, niacin pyridoxine, and cyanocobalamin, is useful in treating schizophrenia, and this treatment has a sound theoretical basis. The APA task force report Megavitamin and Orthomolecular Therapy in Psychiatry discusses vitamins in a very limited way (niacin only) and deals with only one or two aspects of the theory. Its arguments are in part faulty and its conclusions are unjustified.

-Based on a lecture given at a meeting of the American College of Neuropsychopharmacology, Palm Springs, Calif., Dec 47 7 1973 . Reprinted with permission: Am J. Psychiatry, 131:11, November 1974. Copyright 1974 American Psychiatric Association.

References

1.Pauling, L.: Orthomolecular psychiatry. Science 160: 265-271, 1968

2.Hoffer, A.: Niacin Therapy in Schizophrenia. Springfield, Ill., Charles C. Thomas, 1962

3.Osmond, H., Hoffer A.: Massive niacin treatment in schizophrenia: review of a nine-year study. Lancet 1:316-319, 1962

4.Hoffer, A., Osmond H.: Treatment of schizophrenia with nicotinic acid: a ten-year follow-up. Acta Psychiatr Scand 40:171-189, 1964

5.Cleckley, H.M., Sydenstricker, V,P., Geeslin, LE-: Nicotinic acid in treatment of atypical psychotic states associated with malnutrition. JAMA 112:2107-2110, 1939

6.Sydenstricker, V.P., Cleckley, H.M.: The effect of nicotinic acid in stupor, lethargy and various other psychiatric disorders. Am I Psychiatry 98:83-92,1941

7.Kubala, A.L., Katz, M.M.: Nutritional factors in psychological test behavior. J Genet Psychol 96:343-352, 1960

8.VanderKamp, H: A: biochemical abnormality in schizophrenia involving ascorbic acid- Int J Neuropsychiatry 2:204206, 1966

9.Herjanic, M., Moss-Herjanic, B.L. Ascorbic acid test in psychiatric patients. J Schizophrenia 1: 257-260, 1967

10.Pauling, L., Robinson, A.B_ Oxley S.S., et a]: Results of a loading test of ascorbic acid, niacinamide, and pyridoxine in schizophrenic subjects and controls, in
Orthomolecular Psychiatry: Treatment of Schizophrenia. Edited by Hawkins, D., Pauling, L San Francisco, W.H. Freeman and Co., 1973, pp 18-34

11. Orsenberg, LE., Lilljeqvist, A.C., Hsia, Y.E.: Methylmalonic aciduria: metabolic block localization and vitamin B12 dependency. Science 162: 805-807, 1968

12. Lindblad, B., Olin, P., Svanberg, B., et al: Methylmalonic acidemia. Acta Paediatr Scand.57: 417-424, 1968

13.Walker, F.A., Agarwal, A.B., Singh, R.; Methylmalonic aciduria: response to oral B12 therapy. I Pediatr 75:344, 1969

14.Rosenberg, LE,, Lilljeqvist, A.C., Hsia, Y.E., et al: Vitamin B12 dependent methylmalonicaciduria: defective B12 metabolism in cultured fibroblasts. Biochem Biophys Res Commun 37:607-614,1969

15.Williams, R.J.: Biochemical Individuality. New York, John Wiley & Sons, 1957

16.Pauling, L., Itano, ILA., Singer, S.J., et al: Sickle cell anemia a molecular disease. Science I 10: 543-548, 1949

17.Hawkins, D., Pauling, L (eds): Orthomolecular Psychiatry; Treatment of Schizophrenia. San Francisco, W.H. Freeman and Co., 1973

18.Hawkins, D.: Orthomolecular psychiatry: treatment of schizophrenia. Ibid, pp. 631-673

19.Osmond, H.: The background to the niacin treatment. Ibid,pp. 194-201

20.Horwitt, M.K.: Ascorbic acid requirements of individuals in a large institution. Proc Soc Exp, Biol Med 49:248-250, 1942

21.Herjanic, M.: Ascorbic acid and schizophrenia, in Orthomolecular Psychiatry; Treatment of Schizophrenia. Edited by Hawkins, D., Pauling, L San Francisco, W.H.
Freeman and Co., 1973, pp. 303-315

22.Stone, L: The Healing Factor: Vitamin C Against Disease. New York. Grosset and Dunlap, 1972

23.Pauling, L: Evolution and the need for ascorbic acid. Proc Natl Acad Sci USA 67:1643-1648, 1970

24.Pauling, L: Vitamin C and the Common Cold. San Francisco. W.H. Freeman and Co. 1970

25.Milner, G.: Ascorbic acid in chronic psychiatric patients: a controlled trial- Br I Psychiatry 109:294-299, 1963

26.Denson, R.: Nicotinamide in the treatment of schizophrenia. Dis Nerv Syst 23:167-172, 1962

27.Ananth, J.V., Ban, T.A., Lehmann, H.E.: Potentiation of therapeutic effects of nicotinic acid by pyridoxine in chronic schizophrenic & Can Psychiatr Assoc J 18:377-382, 1973

28.Edwin, I., Holten, K., Norum, K.R., et al: Vitamin B12 hypovitaminosis in mental diseases. Acta Med Scand 177:689-699, 1965

29. Pfeiffer, C.C., Iliev, V., Goldstein, L: Blood histamine, basophil counts, and trace elements in the schizophrenias, in Orthomolecular Psychiatry: Treatment of Schizophrenia. Edited by Hawkins, D., Panting, L San Francisco. W.H. Freeman and Co. 1973. pp. 463-510

30. Task Force Report 7: Megavitamin and Orthomolecular Therapy in Psychiatry. Washington, DC, American Psychiatric Association, 1973

31.Ananth, J.V., Ban, T.A., Lehmann, ILE., et al: Nicotinic acid in the prevention and treatment of methionine-induced exacerbation of psychopathology in schizophrenics. Can Psychiatr Assoc J 15:15-20, 1970

32. Hoffer, A., Osmond, H., Callbeck, J.M., et al: Treatment of schizophrenia with nicotinic acid and nicotinamide. J Clin Exp Psychopathol 18:131-158. 1957

33.Greenbaum, G.H.C.; An evaluation of niacinamide in the treatment of childhood schizophrenia. Am J Psychiatry 127:89-93, 1970

34.Kelm, H.: The Hoffer-Osmond Diagnostic Test (HOD), in 'Orthomolecular Psychiatry: Treatment of Schizophrenia. Edited by Hawkins, D., Panting, L San Francisco. W.H. Freeman and Co. 1973, pp. 327-341

35.Pauling, L: No More War! New York. Dodd, Mead and Co. 1958