

The Parenteral Use of Vitamins in the Treatment of Schizophrenia

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The parenteral use of vitamins described in this paper was begun in 1968 in adult schizophrenic patients each of whom had suffered one or more relapses which required hospitalization and/or ECT. The technique was later modified and extended for use in the initial treatment of schizophrenic patients who were responding slowly to biochemical treatment which included the use of vitamins orally.

In those patients who had previously suffered relapses, the parenteral use of the vitamins in a sample of 33 prevented re-hospitalization of 31 patients. The vitamins used were nicotinamide (200 mg./cc), ascorbic acid (500 mg./cc), thiamine-pyridoxine mixture (100 mg. each/cc). One cc of each vitamin was used combined in a single three-cc syringe and administered by deep intramuscular injection three times weekly.

When improvement was established the frequency of injection was reduced to two weekly and finally to a maintenance schedule of once each week for several months. Throughout the course of parenteral treatment the oral medications were maintained and their use continued after the injections were discontinued.

Initially 10 mg. of Elavil were added to the injection of the first week's treatment in those

cases in whom depression was overwhelming. The use of Elavil was discontinued when it was determined that the clinical response was not improved by its addition. During alternate injections the thiamine-pyridoxine mixture was replaced with vitamin B₁₂ (1000 mcg./cc).

Clinical response was seen in most patients by the end of the second week of treatment. In many patients a favorable response to treatment was noted earlier. The oral use of vitamins in mega doses was continued throughout the course of parenteral therapy.

The parenteral use of the vitamins was then extended to the initial treatment of schizophrenic patients who were being treated with mega vitamins and were responding slowly. This group of patients, many of whom were hospitalized because of the severity of their illness, showed a more rapid clinical response than that achieved in similar patients prior to the use of parenteral vitamins. In those patients requiring ECT the response to treatment was in most instances more rapid, and maximum response was achieved with a smaller number of electroconvulsive treatments.



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Gould¹- reported in 1953 that there were indications that, where parenteral vitamin therapy had been given for some time before ECT, memory impairment was reduced or absent and tension did not arise in connection with the treatment. Gould's initial premises for the use of parenteral vitamins in the treatment of delirium tremens were simple: delirium tremens was considered to be a B₁ deficiency-disease-equivalent due to poor food intake and, since spontaneously occurring vitamin deficiency disease was rarely single, he gave "very large" amounts of several vitamins by intravenous administration, by drip or directly into a vein, of glucose 3-10 gm. vitamin C 1.5 gm., B₁ 10 gm., nicotinamide 200-400 mg., B₂, 20 mg., pantothenic acid 0-25 mg.

Gould extended the use of his techniques to the treatment of acute alcoholic psychoses, post-operative confusional psychoses, deliria due to drugs, barbiturate coma, psychoses following continued narcosis and drug withdrawal syndromes. In many of the above cases he reported restoration to normality within 20 minutes to four hours.

Poor alimentary absorption of nutrients is a factor in the development of illness and interference with absorption of medications taken orally is in some cases a significant factor in those patients who respond poorly to treatment or who do not respond at all.

Vitamin insufficiency may be brought about by decreased intake and/or absorption of vitamins, increased body demand due to increased metabolism, inactivation of the B vitamins enzyme systems due to narcotics and by intracellular derangement of metabolism by toxins.

Attention was drawn to the probability of the factor of malabsorption of mega vitamins administered by the oral route in the case of the first patient to receive the parenteral vitamin treatment. This patient had been ill for seven years and had been hospitalized many times; one hospitalization had been for a period of several years.

For a period of two years he had been taking the mega vitamins by the oral route with marginal improvement; his relationship with his parents was stormy, his occupational adjustment was poor. He remained in a constant depression and frequently entertained suicidal ideas.

In the year prior to the use of the parenteral vitamins he had daily been taking niacin 12-15 gm., ascorbic acid 10 gm., Pyridoxine 300 mg., thiamine 3 gm. and various antidepressants and psychoactive drugs. Despite this regimen he had four major relapses which required two periods of hospitalization and the use of ECT. Two relapses responded to courses of ambulatory ECT. His serum ascorbic acid level was investigated and found to be 0.5 (N = 0.6-2).

Parenteral vitamins were begun according to the technique described above and the patient made significant improvement at the end of the second week of vitamin injections. The injections were continued for four months for a total of 22 injections. Six months later, when depression began to recur, another series of 12 injections sufficed to end the relapse. The patient has now maintained his improvement for the year past.

RELATIONS BETWEEN INDOLES AND PSYCHIATRY

The above experience has been repeated in the 31 patients in the group treated by the parenteral vitamins.

A report by Dr. Abram Hoffer³ reveals similar success with many patients who had a history of numerous relapses which required ambulatory ECT or hospitalization. Two patients, who were awaiting admission to hospital, were deteriorating rapidly and were started on the parenteral vitamin treatment. There was no evidence of improvement during the first week's treatment, but by the end of the second week they had both made such significant improvement that neither hospitalization nor ECT was necessary.

Similar reports have been received from others⁴ who have begun to include the parenteral vitamins in the treatment of relapsing patients or in patients whose improvement on mega vitamin treatment was slow. The use of parenteral vitamins in schizophrenic patients who show signs of relapse following the use of marijuana or other hallucinogens has been extremely valuable.

Vitamins have been commonly regarded as tissue catalysts and as such remained unchanged by the metabolic reactions they facilitated. The small daily requirements of vitamins are held to support the view. Catalyst and enzyme are terms often used interchangeably.

Yet Elvehjem⁵ reported that vitamins undergo synthesis (phosphorylation, e.g., in the cases of vitamins B₁, B₂ and nicotinamide) on absorption before combination with a complex protein molecule where-upon enzymatic status is attained. They also undergo degradation and excretion in an

altered form (e.g., uroflavins and nico-tinuric acid). The daily requirement of vitamins is a significant proportion of the total body stores.

Vitamin C is considered by some investigators (Barron⁶) to function in metabolic synthetic processes and to be present in amounts proportionate to the metabolic activity of the nervous tissue, whereas the B group serves tissue respiration. It has been shown that recovery rates in vitamin deprivation experiments depend directly on the size of the replacement dose.

Gould summarizes the rationale for the parenteral use of vitamins as follows:

"If, indeed, one regards vitamins as metabolic agents, whose relation to cellular respiration mirrors in some measure the law of mass action, and remembers that the body stores of some of these substances are not only meagre, but are readily inactivated or rapidly reduced in certain circumstances, then the use of parenteral intensive mixed vitamin therapy in certain groups of clinical conditions becomes reasonable on grounds other than clinical observation. Furthermore, the value of high blood concentrations of vitamins may be seen to reside in the possibility of influencing rapidly the equilibria between the various phases through which the vitamins are built up in the tissues to the enzymes in which they function within the cell, contributing to its metabolic integrity."

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