Can Nutrients Restore Mental Health?

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Patients with a history of mental illness or learning disability and an elevated psychological test score were placed on an individualized nutrient supplement program. The supplement regimen was determined for different individuals by (a) hair analysis2; (b) blood histamine (either actual analysis or signs and symptoms, Pfeiffer, 1973); (c) urine kryptopyrrole (either actual analysis or signs and symptoms, Pfeiffer, 1973); (d) identification of glucose oxidation type (either by symptom response to thiamine or pantothenic acid or by blood analyses for: gases, fasting glucose, and total lipids, Watson's tests, Watson, 1972); and (e) other indications of nutrient deficiencies. These analyses were made to determine which nutrients to eliminate from supplementation and which to accentuate. Improvement of the patient was determined with three different psychological tests: (a) the Hoffer-Osmond Diagnostic (HOD) test,[3] (b) the Experiential World Inventory (EWI), 4 and (c) Green's Perceptual Dysfunction Test for children5 (modified by the present author.)

The data shown in Table 1 represent all patients placed on Orthomolecular nutrient therapy on whom follow-up data were available. Of these 28 patients, 24 were taking or had taken tranquilizers, or were under the care of a psychiatrist or psychologist, or had been diagnosed as having psychological or neurological problems.

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2 Determined by Bio-Medical Data, Inc.

3 Test can be obtained from the Ohio Schizophrenia Foundation, 813 Second National Bldg., Akron, Ohio 44308.

4 Test can be obtained from Mens Sana Publishing Inc., P.O. Box 2966, Grand Central Station, New York, N.Y. 10017.

5 Test can be obtained from the present author or from Dr. R. Glen Green, 301 Medical Bldg., Prince Albert, Saskatchewan, S6V 3K8.

A score below 30 on the HOD test is considered to be non-schizophrenic. However, a score above 3-5 indicates some degree of illness.

All patients in Table 1 had an initial HOD score of 18 or above, 13 had scores above 50, and six had a score below 30. Of these latter six, three had been hospitalized one or more times because of mental illness. Nevertheless, all but one with scores below 30 responded to individualized Orthomolecular treatment within a few days and have continued to function normally. The slower responding patient was one who was already on self-initiated Orthomolecular treatment, but he improved on the adjusted formula. After four months his score had dropped from 23 to 8. He is now working steadily for the first time and has established a Chapter of the Ohio Schizophrenia Foundation.

A normal score on the EWI is 15 or below. A score above 20 indicates some type of mental illness. All patients taking the EWI had a score above 20, and all but one were included in the HOD group. An optimumly healthy score on Green's test is 0. The initial "yes" score of each of the five subjects was respectively: 34, 31, 17, and 5. The last follow-up score for the same subjects was: 2, 13, 5, and 1.

Table 1 shows the effect of individualized Orthomolecular nutrition on the mean psychological test scores. The mean score on all three tests decreased significantly at less than the 5 percent level of confidence. The decrease for the HOD scores from an average of 49.2 to 21.5 indicates a 56.3 percent improvement in the psychological state of the patient as measured by the HOD test. The EWI test scores showed a similar but slightly higher drop of 59.3 percent. The number of "yes" responses on Green's test decreased from 21.7 to 5.2 which constitutes a 76 percent improvement. However, the number of "sometimes" responses remained approximately the same.

Of the patients taking nutrients as directed, all showed an improvement in some manner. Other than a decrease in psychological test scores, types of improvement reported were increased energy level, increased interest in life, greater participation in everyday activities, and improvement in sense of humor.

A type of control group taking the HOD test was available. They were patients who, for one reason or the other, were not taking supplements as directed. A frequent reason given was that they were saving their supplements because of

TABLE 1 EFFECT OF ORTHOMOLECULAR NUTRITION ON PSYCHOLOGICAL TEST SCORES

Patients taking supplements as directed					Not taking supplements
as directed					
HOD		EWI	Green's Dysperception Test		HOD
Yes				Sometimes	
Before Treatment	49.2	67.4	21.7	12.5	64.0
After Treatment	21.5	27.4	5.2	14.5	78.4
Number of Subjects	21	10	4	4	5
Probability	0.0001	0.01	0.05		0.20
Treatment Time	1 to 8 mo.	1 to 6 mo.	1 to 8 m		1 to 6 mo

HOD - Hoffer-Osmond Diagnostic Test.
EWI - Experiential World Inventory.

the expense involved. The average HOD score of this group not only did not decrease, but rather increased although the increase was not statistically significant.

Of the 28 patients represented in Table 1,14 were slow oxidizers, seven were fast oxidizers, and seven were either normal or suboxidizers. Only 19 of the 28 patients were analyzed for histamine or kryptopyrrole, and of these 19, 14 had low histamine, two had high histamine, three had normal histamine, and 15 had high kryptopyrrole. An additional 11 patients (total 39) had been analyzed at the time of the compilation of this data. Only one patient had a normal kryptopyrrole and normal histamine. The majority of this population (63.4 percent) had both abnormal histamine and elevated kryptopyrrole. The most frequent metabolic type encountered was the low histamine-high kryptopyrrole-slow oxidizer. However, all possible combinations have been found.

Watson's formulae for slow, fast, and suboxidizers were altered to suit the needs of the patient. For example, a fast oxidizer with elevated kryptopyrrole must be given vitamin B6 although vitamin B6 is not a component of the fast oxidizer formula and fast oxidizers generally seem unable to tolerate supplemental Pyridoxine. Several patients reported feeling worse on vitamin B6. However, this needs to be more carefully researched. The level of vitamin B6 given was derived from Pfeiffer (1973) and Ellis (Ellis and Presley, 1973), and from the response of the patient. A level of 50 mg x 3/day was generally the starting dose for a slow oxidizer. This level was raised to 2 g/day for people with elevated kryptopyrrole who were still having psychological problems or showing B6 deficiency symptoms. Since too high a level of B6 can induce a deficiency of riboflavin, supplemental riboflavin (50 mg x 3/day) was generally given regardless of the type of oxidizer. The optimum level of B6 is difficult to determine and should be monitored by frequent kryptopyrrole determinations. Either too low or too high a dose of B6 can result in psychological symptoms.

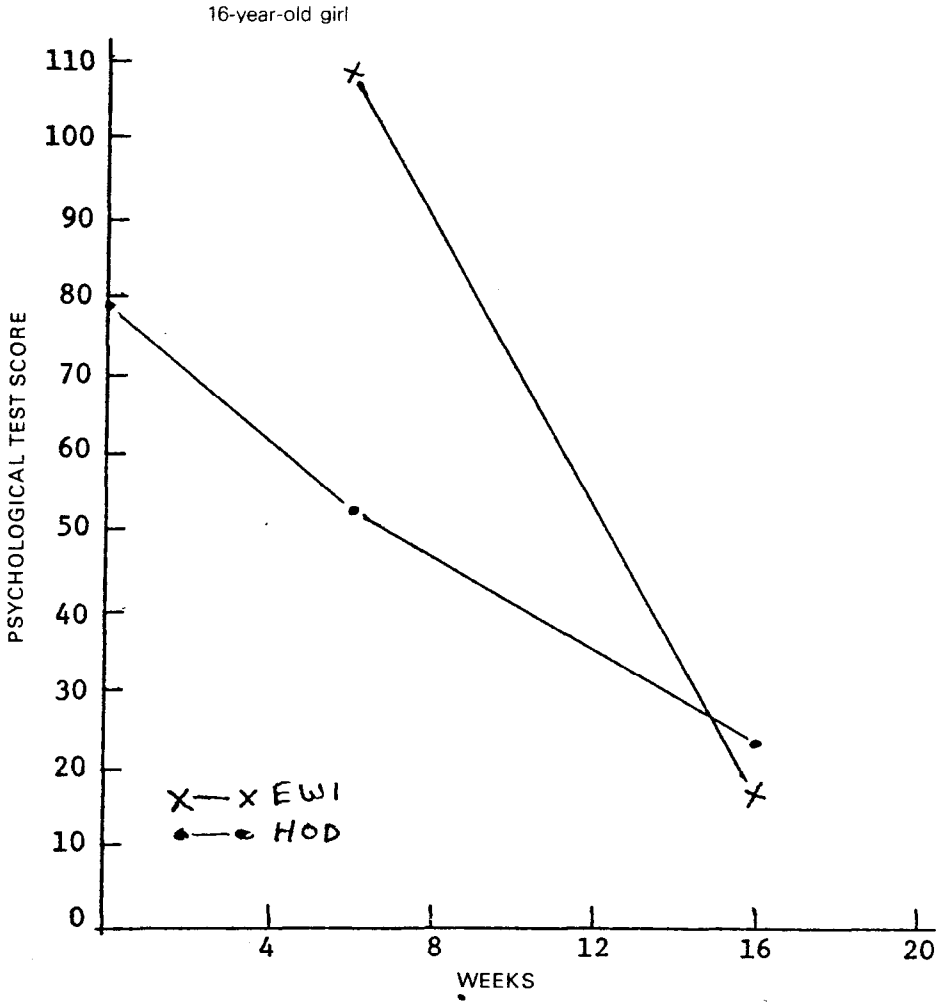
The hair analysis was used, for the most part, to select the supplemental metals. The level of the metals was based on Miller's suggestions from Doctor's Data, except for zinc. Supplemental zinc was based more on Pfeiffer's reports of the beneficial effects of Zn. Zn-Plus was given (1 x 2-3/day) regardless of the levels of Zn in the hair. In cases where the Zn level in the hair was low, higher levels of Zn were given (1 x 4/day). These patients reported an improvement of their condition when Zn was added or increased. Some of them reported a return of their symptoms after two days or so when Zn was not taken.

The level of niacinamide used was the level commonly used by Hoffer (1973) and Hawkins (1973), 1 g x 4/day. The level of niacin ranged from 100 mg x 3 to 1 g x 4/day depending on the tolerance of the individual. The level of ascorbic acid was based on reports by Klenner (1974) and Pauling (1970). Patients were told to determine their dosage by taking enough to cause some gas, but not enough to cause intestinal distress unless an infection had set in, in which case they were told to take enough ascorbic acid to cause at least one thin bowel movement per day until the infection had subsided. A frequent dosage of ascorbic acid was 3 g x 4/day.

The levels of some of the other nutrients can be seen in Figures 1 and 2 which show rather complete data on two subjects. The HOD and EWI scores are shown along with the dosage of supplements given at different times during the treatment period. The blood, urine, and hair data were collected at the beginning of the treatment period. The graphs in both figures show the greater sensitivity of the EWI test over the HOD test. In Figure 2 the EWI revealed a worsening of the patient with a dosage of 300 mg of vitamin B6 while the HOD remained the same.

The routine followed for determining nutrient need and beneficial effects of supplementation was: (a) administration

FIGURE 1



Urine

Kryptopyrrole 46 (0-20)

Blood

Histamine	24.8 (40-80)
Spermine	0.55 (0.79-1.75)
pH	7.49 (H)
pO_2	80
pCO_2	29.5 (L)
HCO_3	1.0
CO_2	22.5
F.glu.	75
T. lipids	428 (L)

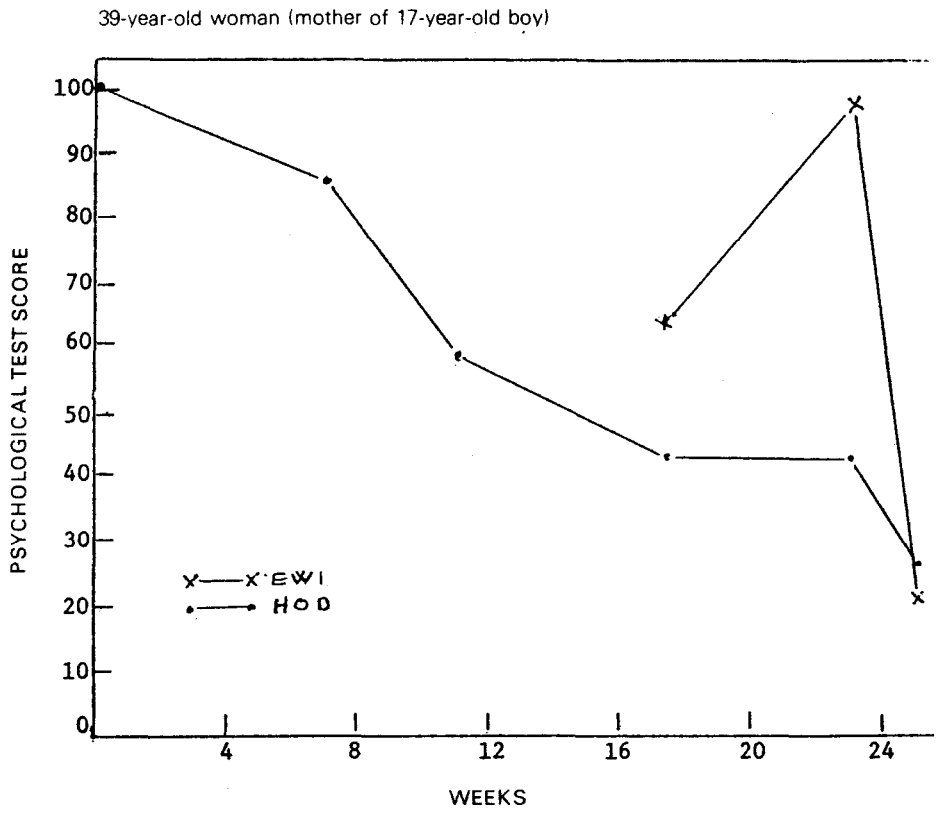
Thiamine 100 mg x 4
x 3 days - Benefit
Pantothenic Acid, 100 mg
x x 3 days - Harm

Hair

Ca	855
Mg	57.3
Na	26 (low)
K	10 (low)
Cu	20
Zn	150
Fe	19
Mn	3
Pb	12
P	170
Cd	1.0
Cr	2.4

Vit. B_1	100mg x 4	Same	Same	Same	Same
Vit. B_2	50mg x 3	Same	Same	Same	Same
Vit. B_6	200mg x 4	250mg x 4	500 x 4	Same	Same
Niacin	100mg x 4	Same	Same	Same	Same
NIARB-Super	1 x 4	Same	Same	Same	Same
Vit. C	2g x 4	Same	Same	Same	Same
Zn-Plus	1 x 4	Same	Same	Same	Same
Dolo-Bone	2 x 4	Same	Same	Same	Same
A/G-Pro	1 x 6	Same	1 x 4	Same	Same
MAGORA	-----	1 x 3	Same	Same	Same
BANAP	-----	1 x 4	Same	Same	Same
Fe-Plus	-----	1	Same	Same	Same
Vit. B_{12}	-----	-----	-----	1mg /wk.	Same
Folic Acid	-----	-----	-----	1mg x 2	Same
Lecithin	-----	-----	-----	-----	1200 x 4

FIGURE 2



Urine
Kryptopyrrole 15 (0-20)
Blood
Histamine 33.2 (40-80)
Spermine 1.32 (0.79-1.75)
Hair

Ca	354 (low)
Mg	38 (low)
Na	45 (low)
K	12 (low)
Cu	17 (sl. low)
Zn	226
Fe	15 (low)
Mn	1
Pb	9
P	168 (Normal)

Pantothenic Acid	-----	30 x 4	Same	Same	x 3	-----
PABA 100mg. x 3	x 4	-----	100mg x 3	Same	-----	-----
Vit. B_1 -----	-----	-----	-----	-----	-----	50 x 3
Vit. B_2 -----	-----	-----	-----	-----	20 x 2	50 x 3
Vit. B_6 50 mg.x4	100mg x 4	-----	-----	100mg x 3	25 x 2	50 x 3
Vit. B_{12} 100mgx4	Same	-----	100mg x 3	Same	Same	Same
Folic -----	-----	-----	-----	-----	1 mg.	Same
Vit. C 2g x 4	Same	1g x 4	Same	Same	Same	x2
Bioflav.-Hesp. ----	-----	3 x 2	3 x 3	Same	Same	Same
Niacinamidel/2gx4	Same	1g x 4	Same	Same	Same	Same
Vit. E -----	-----	400 x 3	Same	Same	x2	Same
Vit. A -----	-----	25,000 x 2	Same	Same	Same	Same
Lecithin -----	-----	1200mg x 4	Same	Same	Same	Same
Dolo-Bone -----	3 x 4	2 x 3	Same	Same	Same	Same
Zn-Plus 1 x 2	1 x 3	1 x 4	Same	Same	x3	Same
Mg-Plus -----	1	-----	-----	-----	1 x 2	Same
Mn-Plus -----	1	1	Same	Same	Same	Same
Fe-Plus -----	1	1	Same	Same	Same	Same
Li_2CO_3 -----	-----	-----	-----	-----	300 x 2	Same
K-gluconate	620mg x 3					

of psychological tests, (b) recording a careful history of the patient to determine nutrient deficiency symptoms and signs and symptoms of high or low histamine and high kryptopyrrole (see Table 2), (c) either the administration of Watson's blood tests for determining oxidation type[6] or the administration of thiamine (100 mg x 4 for 3 days) and pantothenic acid (100 mg x 4 for 3 days) separately and sequentially to determine the patient's response, (d) obtaining a hair sample for analysis, and (e) collection of blood and urine samples.[7] Patients were advised to stay off all sweets and stimulants, to eat a high-protein low-carbohydrate diet with a variety of fresh fruits and vegetables, and to search for possible allergens (Klotz, 1971). The latter met with success on only two or three people mostly because convincing people of the usefulness of this involves much more time than was spent on most patients. The families were also urged to reduce the stress in the lives of the patients until they had a chance to respond to the nutrients. Job hunting appeared to be the most stressful event encountered. Advice on diet and behavior, however, is much more difficult to follow than swallowing supplements. No attempt was made to collect data on these factors.

Since a fairly good idea of a patient's nutrient needs can be gotten from the history and response to either thiamine and pantothenic acid or Watson's blood tests, the patient can be put on some nutrients on the first visit and more nutrients by the end of a week. Since it took two to four weeks for the hair results, six to eight weeks for the histamine and kryptopyrrole results, still more time for scheduling, and it was two to six months from the initial visit before some patients were able or willing to get the blood and urine tests, the period before substantial improvement was much, much longer than would have been necessary had all information been available before treatment began. Nevertheless, under these circumstances Figure 3 shows the average improvement of patients as measured by decrease in HOD scores. Thus, the greater improvement of patients at six and eight months is due, no doubt, to a combination of longer treatment period of some nutrients and change in formula (i.e., the addition, elimination, or change in dosage of nutrients.)

Table 3 shows the correlation coefficient matrix for age and the various parameters used in determining the individualized Orthomolecular nutrient program. The actual coefficient is not given because the N differs for the various correlations. The dark or double lines divide the table between age, urine (mauve factor or kryptopyrrole), blood, hair, and psychological data. Age and blood histamine were correlated with a larger number of parameters than any of the other factors.

Of 25 possible correlations, age correlated significantly with 8 parameters at the 5 percent or less level of confidence: blood, 4; hair, 3; psychological, 1. Histamine also correlated with 8 parameters: blood, 6; hair, 1; and age. As could be expected, the hair parameters correlated with more hair parameters than with blood parameters. Likewise, there were more blood-blood correlations than blood-hair correlations. Of 37 possible blood-blood correlations, 15 were significant (40 percent). Of 66 possible hair-hair correlations, 20 were significant (30 percent).

Interestingly, the urine parameter correlated with two hair parameters (K and Zn) while not correlating with any of the blood parameters. The negative correlations between urine kryptopyrrole and Zn is in keeping with Pfeiffer's report that kryptopyrrole complexes with zinc removing it from the body (Pfeiffer, 1973). The failure of either blood histamine or

6 These analyses were made at Children's Hospital in Akron. The blood gases and fasting glucose were done on arterial instead of venous blood.

7 These samples were collected at Akron General Medical Center and mailed to Pfeiffer's laboratory for analysis of histamine and kryptopyrrole. Pfeiffer's lab also analyzes the blood for spermine and spermidine.

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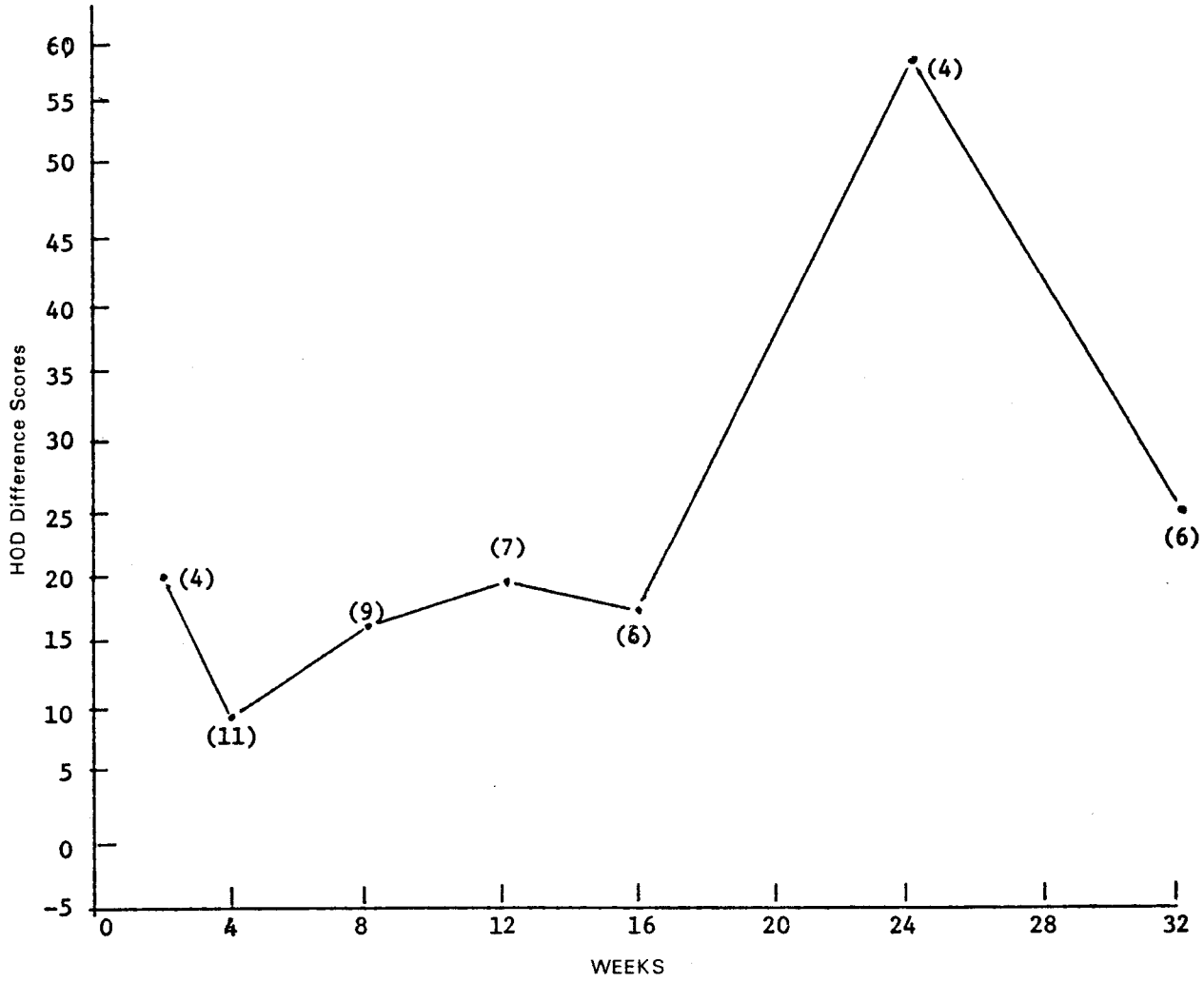
TABLE 2

Clinical Symptoms and Responses of Emotionally and Mentally III People of Different Metabolic Types

	H- Histapenia(50%)	H + Histadelia(20%)	**Pyroluria** Malvaria (30%)
Suicidal depression	1 +	4 +	1 +
"Blank mind"	1 +	4 +	1 +
Thought disorder	4 +	2 +	2 +
Paranoia	3 +	1 +	1 +
Hallucinations	4 +	1 +	2 +
Compulsive traveler	+	0	?
Mind races	?	+	?
Headaches	1 +	4 +	?
Fat distribution	Stalagmetic	Normal	Normal
Orgasm	Slow	Fast	None
Sex interest	Low	Normal	Low-High
Reaction to pain	Low	High	?
Dental caries	4 +	1 +	?
Salivary flow	1 +	4 +	?
Head colds (symptoms)	Few	Normal	?
Skin pigmentation	Fair	Normal	Pale
Sunlight sensitive	Burns	Normal	Burns
Allergies	Rare	Common	?
EEG overarousal	4 +	4 +	Occas. slow waves
EEG alpha waves	Low energy	High energy	Isolated high spikes
Familial disorder	1 +	3 +	1 +
Age of onset	Any	■ Adult	Any
Exercise benefits	4 +	2 +	1 +
Obsessions	1 +	3 +	1 +
Barbiturates, other sedatives	0	Benefit	Harm
Antihistamines	0	Benefit	0
Electroshock benefits	3 +	1 +	
Dilantin	Harms	Benefits	Harm?
Folic 2.5 mg/day; B12 1 mg	Benefits	Harm	Benefits
Street drugs	0	Often	?
Constipation	?	?	3 +
Bellyache	?	?	3 +
Stretch marks in skin	1 +	1 +	4 +
White spots on nails	?	?	4 +
Knee and other joint pains	?	7	3 +
Can't eat breakfast	?	?	3 +
Dysperception	+	1 +	3 +
Affect	Poor	So-so	Good
Don't remember dreams	1 +	1 +	3 +
Neurological symptoms: amnesia, tremor, shaking. clenched fist, muscle spasms	1 +	1 +	3 +
Irregular menstrual periods	1 +	1 +	4 +
Loss of smell or taste	1 +	1 +	3 +
Unexplained fever and chills	0	0	3 +
Anemia nonresponsive to Fe	0	0	3 +
Stress-induced psychosis	0	0	3 +
Hypoglycemia	2 +	2 +	4 +

Depression 60%	Headache 45%	Exhaustion 67%
Insomnia 50%	Vertigo 42%	Sweating 41%
Anxiety 50%	Tremor 38%	Tachycardia 37%
Irritability 45%	Muscle pains and backache 33%	Appetite loss 32%
Crying spells 32%	Numbness 29%	Indigestion 29%
Phobias 31%	Blurred vision 24%	Cold hands or feet 26%
Concentration difficulty 30%	Muscle twitching, cramps 23%	Joint pains 23%
Confusion 26%	Staggering 18%	Obesity 19%
Un-or antisocial 22%	Fainting or blackouts 14%	Abdominal spasms 16%

FIGURE3



Improvement in subjects on orthomolecular treatment as measured by the HOD test.
HOD difference = Before - After.
(N) Number of subjects.

urine kryptopyrrole to correlate with copper in the hair, however, is not in agreement with Pfeiffer's report that copper is high in the tissues of the low-histamine patients and in the high-kryptopyrrole patient. Other surprises are the lack of correlations between Zn and Cu in the hair and the failure of the psychological tests to correlate with any of the blood and urine parameters. However, the HOD test correlated with lead level in the hair which is in keeping with reported toxic effects of lead on the brain (Pueschel et al., 1972; Sauerhoff and Michaelson, 1973).

In summary our experience and data show that Orthomolecular nutrition can be used to improve the condition of the emotionally and mentally ill. When the time and care is taken to individualize treatment, practically all patients can be expected to improve to some extent within a few days if no mistake has been made in determining psychochemical type. Improvement tends to increase with length of time on treatment. Whether health can be restored is another matter. However, one patient who was too ill to take the psychological tests was reported by his mother to be

TABLE 3 CORRELATION COEFFICIENT MATRIX

	Age	Mau.	Hist.	Sper.	pH	$p0_2$	pco_2	$HC0_3$	co_2	Glu.	Lipids	Ca	Mg	Na	K	Cu	Zn	Fe	Mn	Pb	P	Cd	Cr	HOD	EWI
Age	1.0																								
Mauve		1.0																							
Hist.	+		1.0																						
Sper.	++		++	1.0																					
Spd.	++		++	++																					
pH					1.0																				
po_2						1.0																			
$pC0_2$			+		-		1.0																		
HCO_3	-						++	1.0																	
co_2							+++	++	1.0																
Glu.			+	++	+					1.0															
Lipids									++		1.0														
Ca												1.0													
Mg												++	1.0												
Na					++	-								1.0											
K														+++	1.0										
Cu	--						+					++	+			1.0									
Zn													+				1.0								
Fe	-		-									++	++	+				1.0							
Mn											++	++						++	1.0						
Pb											++					+		++	++	1.0					
P	++								-				+								1.0				
Cd									+							+				++		1.0			
Cr																		++	++		-	++	1.0		
HOD	-																			+				1.0	
EWI																								+++	1.0

++ Positive at -- 0.01 probability Negative at 0, 01 probability

\+ positive at 0.05 probability - negative at 0.05 probability

well within one week. He was a slow-oxidizer, high-histamine, high-kryptopyrrole. A few others for whom psychological data were not available have improved to the point of appearing normal as long as the supplements, diet, and allergen avoidance are adhered to. It certainly appears that the chronically mentally ill person is never cured, but can be controlled with correct Orthomolecular treatment and diet control. The reduction of stress in the pyrolleuria (high-kryptopyrrole) person is a very important factor which must be achieved for optimum results. However, Orthomolecular treatment will increase tolerance of stress so a more normal life can be achieved.

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