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Metal and the Mind

1. Chronic fatigue and adrenal fatigue
   A. Energy is required for all body functions.
   B. Chronic fatigue is a factor in all chronic illness whether you feel fatigued or not.
   C. Impaired adrenal function is always present in chronic fatigue and illness.
   D. There is no medical treatment for adrenal weakness short of total failure.
   E. Adrenal fatigue and weakness develop over years of stress.

2. Causes of chronic fatigue
   A. The first sign of developing adrenal fatigue is reliance on stimulants.
   B. Prior to obvious or severe fatigue problems, many other symptoms and conditions develop as energy levels decline.
   C. Stimulants can be substances such as caffeine, nicotine, alcohol, drugs and sugar.
   D. Emotional and behavioral stimulants are anger, fear, over-activity, excessive exercise and other stimulating and disturbing states and activities.
   E. Sugar is the most common stimulant used beginning in childhood and causes many biochemical disturbances and much adrenal stress. It is a major cause of copper/zinc imbalance.
   F. The poor nutrition typical of developing fatigue due to coffee, alcohol and sugar and the impaired digestive function due to lack of energy, accelerates the decline into chronic fatigue.
   G. Heavy metal excretion requires good adrenal function. Exposure is constant due to years of pollution which continues to the present. Adrenal fatigue and zinc deficiency allows metals to build up in body tissues.
   H. The heavy metal load in the body creates a 24-hour a day source of stress further weakening the adrenal glands.

3. What is copper toxicity?
   A. Proper copper utilization requires good liver, gall bladder and adrenal gland function.
   B. If excretion becomes impaired, copper builds up in the liver, brain, joints and lungs.
   C. Impaired liver and adrenal gland function impairs the production of copper binding proteins required to safely transport copper through the blood.
   D. Copper is very common in the diet, especially in vegetarian diets and poor excretion will result in excessive build up of copper, a heavy metal, in the body.
   E. Excess copper interferes with energy production at the cellular level which promotes the further development of chronic fatigue.
   F. Initially, copper is stimulating to the brain and will mask feelings of fatigue and tend to create hyperactivity. The stimulant effect can give rise to cravings for high copper foods.
   G. Copper toxicity causes many physical symptoms including pain, skin rashes, hormonal imbalances, blood sugar imbalances, arthritis and digestive problems.
   H. The tendency of copper to build up in the body is similar to that of iron, another heavy metal.
4. Copper and Stress

A. Copper accumulation under stress is a short term defense mechanism which is beneficial in helping the body respond to stress initially.

B. The initial response to stress is to lose zinc and magnesium which increases the oxidation rate, and to retain copper which is stimulating to the nervous system.

C. Chronic, unremitting stress never gives the body time to recover and right the biochemical balance. Copper/zinc imbalance takes hold and becomes self reinforcing.

D. Copper inhibits adrenal hormone production, impairing the stress response. Inability to handle stress can give rise to anxiety as the person can feel they are not up to life's challenges.

E. High copper causes zinc to decline. Zinc is an important calming mineral for the brain. High copper and low zinc is very agitating and activating to the mind.

5. Copper/Zinc Imbalance

A. Copper's effect on zinc is a major cause of the symptoms and problems caused by copper toxicity. Zinc is an extremely important nutrient and not common in the diet as copper is.

B. Zinc is essential for all protein synthesis in the body and for a proper immune system. It is essential for adrenal hormone production and for the production of proteins that bind to heavy metals to carry them out of the body. Zinc is required for normal appetite, taste and smell.

6. Copper and the Mind

A. Copper strongly affects the mind as the toxicity becomes more severe. Copper is as stimulating to the mind as amphetamine. Eventually, the stimulation gives way to exhaustion and depression. Switching back and forth between highs and lows can go on for years before going into a permanent low state. It can be a factor in the development of schizophrenia.

B. Copper stimulates the production of epinephrine, norepinephrine, dopamine and serotonin; all activating neurotransmitters in the brain.

C. Once the liver is over-loaded with copper, it is stored in the brain. Copper stimulates the di-encephalon or emotional brain, zinc stimulates the cortex or new brain and is calming to the emotions. Copper toxicity causes emotional extremes both high and low and can be part of the emotional symptoms of PMS.

7. Methylation and the Mind

A. Studies show that as many as two-thirds of schizophrenics have high copper and low zinc and manganese especially during active phases.

B. Elevated copper results in excessive breakdown of histamine. Histamine is a neurotransmitter and also regulates methyl. When histamine is low, methyl rises, and vice versa.

C. Methyl is extremely important in neurotransmitter function, cell wall formation and nerve myelination. Fatty acid metabolism, allergic responses and energy transfer are strongly dependent on proper methylation.

D. SAMe and methionine are the most important sources of methyl groups (-CH3). The methylation cycle requires a constant source of folic acid and B12. Mercury will disrupt the methylation cycle as a heavy toxic burden will divert homocysteine to detoxification instead of to the formation of methionine as a source of methyl.

E. Paranoid schizophrenia is associated with over-methylation, autism is associated with impaired methylation.

8. Metallothionine

A. Metallothionine is required for immunity, brain and gastrointestinal tract maturation,

and the regulation of metals.

B. It is essential for the maintenance of the proper ratio of copper to zinc. A copper/zinc imbalance is a sign of poor metallothionine function. Zinc is required for metallothionine formation.

C. It envelopes heavy metals and carries them out of the body. Without metallothionine, the metals react with sulfhydryl groups such as those present in the enzymes which break down gluten and casein. Food intolerance to gluten and milk is very common in copper toxicity associated mental conditions such as autism, bi-polar, and schizophrenia.

D. Nearly all of the symptoms suffered by autistic patients correspond to the symptoms of a metallothionine deficiency.

9. Pyroluria

A. Pyroluria is characterized by excess krytopyrrole in the urine. It is a by-product of hemoglobin formation. It is a hereditary condition seen in about 11% of the general population but in 52% of schizophrenics and 40% of alcoholics. The pyrroles bond to B-6 and zinc and carry them out of the body through the urine resulting in severe deficiency.

B. Family tendencies seen with pyroluria include cluster headaches and migraines, depression, fatigue including chronic fatigue, sensitivity to cold, anemia, nausea and appetite problems, lack of dream recall, suicides and suicidal depression.

C. Initial onset of more severe symptoms usually occurs in teenage years but can begin later in life depending on the stress level. Pyroluria is strongly aggravated by stress and stress intolerance is always present to some degree.

D. Pyrolurics will have a history of the symptoms of B-6 and zinc deficiency from early in life. These include poor appetite, motion sickness, blood sugar problems, anemia, rib pain when running, drug and alcohol intolerance, crowded upper front teeth, joint problems, tingling, tremors, twitching, cramps, late onset of puberty, pale, thin fingernails, early greying of hair, pale skin, skin problems, stretch marks, mental problems, delusions and dis-perceptions, and bouts of extreme fatigue.

E. Production of krytopyrroles can double under stress. History of poor response to stressful events such college, joining the military, love affairs, and moving. Taking B-6 and zinc in higher amounts prior to and during such events can prevent an episode.

F. The loss of zinc in pyrolurics, promotes copper toxicity along with all of the problems associated with it.

10. Slow Oxidation

A. Copper reduces the function of the adrenal and thyroid glands which slows down the metabolic rate.

B. Oxidation means to burn or mix with oxygen. Those who burn food at a slower than ideal rate are called slow oxidizers.

C. The initial, alarm response to stress, normally causes a state of fast oxidation. With unremitting stress, eventually this gives way to slow oxidation as energy levels drop.

D. Slow oxidation creates withdrawal and introversion, less emotional expression. Very slow oxidation tends toward depression, despair and suicidal thoughts.

E. Physically the slow oxidizer has dry skin, sweats little, tends toward constipation and depression. Low blood sugar, weight gain, low adrenal function, and low blood pressure reflect the under activity of the metabolism.

11. The Calcium Brake

A. Calcium and magnesium are part of the body's braking system. Newborns have relatively low levels of calcium and magnesium. As we age, the body applies the calcium brake and we slow down more and more.

B. Copper causes calcium and magnesium to rise, and sodium and potassium to decline. Calcium provides a buffer against the constant stress that is the cause and effect of copper toxicity. Slowing the oxidation rate helps to slow the rate of collapse in the body.

C. Calcium reduces cell permeability and slows all transport of substances into and out of the cell, slowing the metabolism.

D. Magnesium is the other primary braking mineral and it accumulates in slow oxidation. Magnesium is involved in more energy producing reactions than possibly any other mineral.

E. During stress, magnesium is the first mineral to be lost which allows the body to go into fast oxidation to respond to the stress.

F. As the body accumulates calcium and magnesium in slow oxidation, the more exhausted person will retain more calcium creating a high calcium and magnesium ratio. This disturbs insulin function leading to hyperinsulinism and hyproglycemia.

12. Slow Oxidation and Blood Sugar

A. Chronic hypoglycemia and Type 2 diabetes are strongly associated with slow oxidation.

B. Copper toxicity raises calcium and lowers potassium in the tissues. Potassium is needed to activate thyroid hormone at the cellular level. This impairs glucose utilization by the cell for energy production. Poor cellular glucose utilization can give the same symptoms of low blood sugar even if blood levels are normal.

C. Impaired adrenal function results in low cortisol production. Cortisol is an important regulator of blood sugar levels. Low cortisol results in chronic low blood sugar and poor energy production which slows the oxidation rate.

D. High calcium and magnesium slows the transport of glucose through the cell membrane. This can result in cellular hypoglycemia, hyperinsulinemia, and diabetes as the glucose remains in the blood instead of entering the cells to be used for energy.

13. Slow Oxidation and Aging

A. Sodium and potassium are the great solvents of the body.

B. As they decline in slow oxidation, many minerals begin to drop out of solution and precipitate into the tissues.

C. Calcium begins depositing in the arteries, joints, heart and skin. As slow oxidizers age, the body builds up more and more unutilized minerals in the form of iron, manganese and calcium deposits.

D. Eventually this creates the "calcium shell" as the high calcium creates rigidity and unresponsiveness as a defensive response to stress and life.

E. Children are naturally fast oxidizers and slow oxidation is a sign of aging. Children in slow oxidation are becoming more and more common as a result of toxic metal exposure, poor nutrition and stress, making them old long before their time.

14. Toxic Metals
    A. Aluminum
    B. Mercury
    C. Cadmium

The detailed information on all of the above subjects and more is available at www.tvernonlac.com.

Bibliography
and Recommended Reading

Nutritional Balancing and Hair Mineral Analysis, Lawrence Wilson, M.D.
Energy, Colin and Loren Chatsworth
Toxic Metals in Human Health and Disease, Dr. Paul C. Eck and Dr. Larry Wilson
The Strands of Health: A Guide to Understanding Hair Mineral Analysis, Rick Malter Ph.D.
Trace Elements and Other Essential Nutrients: Clinical Application of Tissue Mineral Analysis, Dr. David L. Watts
Toxic Metal Syndrome: How Metal Poisonings Can Affect Your Brain, Dr. H. Richard Casdorph and Dr. Morton Walker
Why Am I Always So Tired?, Ann Louise Gittleman, M.S., C.N.S.
Mental and Elemental Nutrients, Carl C. Pfeiffer, Ph.D., M.D.
Nutrition and Mental Illness, Carl C. Pfeiffer, Ph.D., M.D.
Natural Healing for Schizophrenia and Other Common Mental Disorders, Eva Edelman
Depression Free, Naturally, Joan Mathews Larson, Ph.D.
Changing the Course of Autism, Bryan Jepson, M.D.
Children With Starving Brains, Jaquelyn McCandless, M.D.
Gut and Psychology Syndrome, Natasha Campbell-McBride M.D.
Healing Schizophrenia, Abram Hoffer, M.D.
The Natural Medicine Guide to Schizophrenia, Stephanie Marohn
The Natural Medicine Guide to Autism, Stephanie Marohn
Adrenal Fatigue: The 21st Century Stress Syndrome, James L. Wilson, N.D., D.C., Ph. D.
Chronic Fatigue Unmasked, Geral E. Poesnecker, N.D., D.C.
An Alternative Approach to Allergies, Theron G. Randolph, M.D. and Ralph W. Moss, Ph. D.
Dr. Atkins' New Diet Revolution, Robert C. Atkins
The Yeast Connection, William Crook, M.D.