TRACE ELEMENTS, INC.

Newsletter

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Autoimmune Disease and Women

The body normally protects itself through activation of the immune system. Sometimes however, the immune system becomes unable to distinguish the difference between normal cells and invading organisms and begins attacking itself. This abnormal response is known as an autoimmune disease. Approximately eighty diseases have been associated with an abnormal immune response and have been estimated to effect over fifty million people in the United States. Women seem to have a much higher occurrence of this condition compared to males with an average of over seventy five percent of cases occurring in women.[1] Some conditions occur at a rate of 10 to 1 in women compared to men and the cause of this disparity is unknown at this time, however there are a number of theories.

Causes of Autoimmune Disease

There are probably, as many factors that can trigger this condition as there are known autoimmune diseases. Theories range from genetic, hormonal, and environmental factors to the presence of fetal cells in the mother following pregnancy, or introduced cells from blood transfusions.

Bianchi at the New England Medical Center reported that fetal cells following pregnancy remain in the mother's blood for decades, even if the fetus is not carried to term. They also found that the mother's cells can transfer to the child and that some mothers not only have cells from their child but those from their mother as well. Researchers have found that women with scleroderma have a higher number of fetal cells in their blood compared to women who do not have an immune disorder. Cells of twins can also intermingle. [2,3]

Genetics are thought to be related to the development of autoimmune disease since the condition is commonly found in families. Determining genetic susceptibility has been difficult due to its many different manifestations and because there may be mulitple factors needed to trigger the condition.

Hormones have long been suspected as factors influencing autoimmune conditions in women, especially estrogen, progesterone, and prolactin. Most autoimmune conditions develop during young adult years. Lupus tends to be most common in women during childbearing years and those affected tend to have higher than normal estrogen levels. However, some conditions such as rheumatoid arthritis tend to improve in women when they are pregnant, a time when estrogen levels are high. [4,5]

A news release from the NIH in 1999 reported information from several studies relating environmental chemical exposures to the development of autoimmune disease. Animal studies have shown the immuno-toxic effects of chemicals have a more dramatic response when exposure occurred prenatally, resulting in lifelong immunosuppression. Other environmental factors that may trigger an autoimmune response include radiation, stress, heavy metals, and dietary factors. [6]

The question remains however, why are women more susceptible to autoimmune conditions than men are? The answer may lie in the metabolic characteristics of the sexes.

Disease Susceptibility and Gender

Women and men differ not only in morphology, but physiology, psychology, immunity and even cellular and molecular activity, all of which contribute to sex-related differences in susceptibility to disease. Draper categorized disease susceptibility based upon gender as early as 1944.[7] To determine if this correlation exists today, we statistically analyzed approximately 100,000 hair tissue mineral analysis (HTMA) profiles from our database for comparison. Amazingly our findings were similar to Draper's conclusions from the early 1900's. The results of our statistical study presented in table 1 shows the percentage of incidence of some common diseases based upon gender.

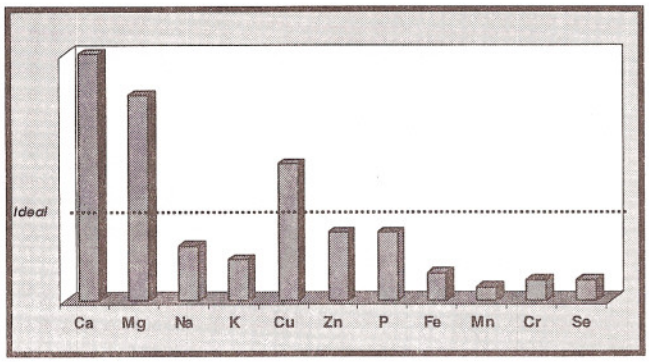
Table 1

CHART OF SEX-DISEASE INCIDENCE

	Female	Male
Autism	20%	80%
A.L.S.	36%	64%
Cataracts	80%	20%
Chronic Fatigue Syndrome	80%	20%
Crohn's Disease	70%	30%
Dyslexia	50%	50%
Epilepsy	60%	40%
Gallstones	84%	16%
Gout	20%	80%
Lupus	97%	3%
Multiple Sclerosis	75%	25%
Myasthenia Gravis	80%	20%
Parathyroid Disorders	85%	15%
Parkinson's Disease	35%	65%
Scleroderma	90%	10%
Scoliosis	78%	22%
Sjogren's Syndrome	94%	6%
Thyroid Disorders	83%	17%

Gender and Metabolic Characteristics as Recognized Through Hair Tissue Mineral Analysis (HTMA) Patterns

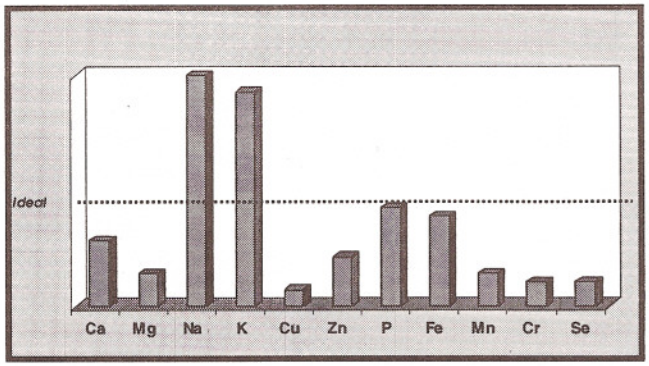
Figure 1
Para-sympathetic Mineral Pattern



Generally speaking women have a lower metabolic rate than men do. This has been recognized through thousands of HTMA patterns performed by Trace Elements, Inc. (TEI). TEI has long categorized neuroendocrine metabolic types through mineral pattern recognition from HTMA. TEI recognizes eight neuroendocrine metabolic types consisting of Fast Metabolic Types 1 through 4 and Slow Metabolic Types 1 through 4. The Fast Metabolic Type 1 is synonymous with sympathetic neuro-endocrine dominance, fast oxidation, and Type A personality. The Slow Metabolic Type 1 is synonymous with parasympathetic neuro-endocrine dominance, slow oxidation, and type B personality.

Figure 1 shows the Slow Metabolic Type 1 mineral pattern and Figure 2 the Fast Metabolic type 1 mineral pattern. These patterns are influenced by neuroendocrine activity.[8] Through the analysis of over 100,000 recent laboratory results from our database, we found that almost 80 percent of the women fell into the para-sympathetic category.

Figure 2
Sympathetic Mineral Pattern



Only about 50 percent % of males fell into a parasympathetic category. This illustrates that generally speaking, men have a higher metabolic rate (more sympathetic dominant) compared to women (more parasympathetic dominant). This data may help to explain why women are much more prone to developing cellular autoimmune conditions compared to men and why such a gender gap exists.

The Humoral and Cellular Immune Response

We have also categorized the immune system into sympathetic and parasympathetic branches through HTMA mineral patterns. The cellular immune response we associate with a parasympathetic mineral pattern (figure 1) while the humoral immune response is associated with a sympathetic mineral pattern (figure 2).

The humoral immune response is antibody mediated involving the B-cells and is the primary defense against invading organisms that appear in the blood and other body fluids located outside the cell such as bacteria and toxins. The humoral system also reacts to viruses before they enter cells and those that are not contained within an envelope.

The cellular immune response involves the T lymphocytes and other factors responsible for transfer of immunity and acts as a defense against viruses, fungi, intracellular organisms, tumor antigens, etc. It is responsible for the resistance to organisms that reproduce within cells, such as viruses. The cell-mediated immune response can also actively destroy mutating cells or molecules formed by some types of cancers.[9] In the normal healthy individual both the cellular and humoral system work together in fighting disease. However, in some individuals one branch can become dominant over the other, leading to an abnormal immune response, or autoimmune disease. Autoimmunity can involve either the cell-mediated or humoral mediated response.

In review, the cellular immune response is primarily thymus (parasympathetic) mediated and the humoral immune response is primarily adrenal (sympathetic) mediated. In viewing the immune system in this manner, the difference between men and women becomes more evident.[10]

Factors That May Trigger Autoimmune Reactions

Most people may at one time or another develop a mild autoimmune response, but who usually recover without long lasting effects. However, some people who are predisposed to autoimmune reactions may develop an exaggerated and prolonged response. As stated earlier there may be as many triggering factors as there are known autoimmune diseases. Virus and bacteria are probably two of the most common triggers. Generally speaking, enveloped viruses are known to produce a cellular immune response (thymus mediated-parasympathetic), while nonenveloped viruses and bacteria contribute to a humoral immune response (adrenal mediated-sympathetic).

An immune response whether humoral or cellular also involves the neuroendocrine system (hypothalamic-pituitary-adrenal axis (HPA).[11] This response also involves and affects the nutritional status of the host,[12] which may be reflected in the HTMA model.

Humoral Immune Response and the HTMA Model

We propose that the sympathetic HTMA mineral pattern reflect the humoral immune response. Bacteria and non-enveloped viruses stimulate the metabolic rate and can exaggerate the sympathetic reaction via increased adrenal cortical activity. As the humoral immune response continues or becomes chronic, it tends to raise the metabolic rate via increased activity of the sympathetic endocrine glands, and stress hormones that in turn suppress the cellular or thymus response.

Amyotrophic Lateral Sclerosis (ALS), a motor neuron disease is classified in the sympathetic neuroendocrine category and humoral immune dominance. Both factors are related to an increased metabolic rate. Studies reported by Desport, et al, found that in fact patients diagnosed with ALS are hypermetabolic.[13] This hypermetabolic state has been found in other conditions such as cystic fibrosis (CF).[14] Studies have reported increased thyroid activity in patients experiencing Parkinson's disease as well.[15]

Some sex hormones, such as testosterone, progestins, and prolactin, enhance the humoral immune response and others suppress it. Estrogen is known to suppress the humoral or sympathetic response. This helps to explain why some humoral autoimmune conditions occur at different stages of endocrine activity. For example some women may have rheumatoid arthritis that goes into remission when they become pregnant, a time when estrogen is the highest. Following pregnancy their condition returns as estrogen levels diminish. [16]

Cellular Immune Response and the HTMA Model

The parasympathetic HTMA mineral pattern reflects the thymus cellular immune response. Viruses are the most common triggers to increased thymus immune responses. An increased or chronic thymus response tends to reduce the metabolic rate. Hormones that further contribute to an increased thymus immune response and lower the metabolic rate include estrogen, parathyroid hormone and insulin.[17] These hormones as well as the thymus response suppress adrenal and thyroid expression.

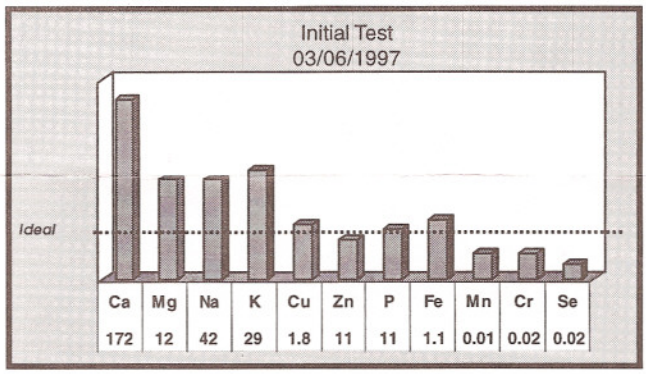
Scleroderma-A Case Study of Autoimmunity

Scleroderma is a chronic, degenerative condition that leads to over production of collagen, excessive soft tissue calcification leading to hardening and tightening of the skin, and blood vessel deterioration. Systemic scleroderma is life threatening and affects articular structures and internal organs including the esophagus, intestinal tract, heart, and kidneys. It is estimated to affect 300,000 people in the U.S. eighty- percent being women of childbearing age. The following case study describes a patient diagnosed with scleroderma and her response through guided nutritional therapy based upon her HTMA tests.

The patient was approximately 50 years of age when diagnosed in 1995 with scleroderma, Raynaud's disease as well as polymyositis and arthritis. The diagnosis was confirmed by third and fourth opinions of several experts in the field. Prognosis was guarded and therapy involved hospitalization for several months with high dose steroid treatment. The patient and family decided to look for other alternative therapy and requested to be discharged from the hospital. Steroids were discontinued and at that time the patient was given a life expectancy of two to two and one half years.

After consulting other doctors the patient eventually was referred to Mrs. Virginia Lucia in Massachusetts. Mrs. Lucia is an experienced nutritional consultant with many other skills as well as a having extensive knowledge and experience with HTMA. A hair sample was submitted to TEI for analysis on March 6, 1997. At that time the patient's condition had advanced, with further tightening of the skin difficulty swallowing, muscle weakness and considerable weight loss. The patient's initial HTMA test results are shown in figure 3.

Figure 3



The initial HTMA pattern revealed a parasympathetic dominance (slow metabolic type), reflecting a cellular (thymus) immune dominance. The pattern revealed a very low zinc level as well as a low zinc/copper (Zn/Cu) ratio indicating an estrogen dominance. The marked elevation in the calcium/magnesium (Ca/Mg) ratio indicated a parathyroid and insulin dominance. Dietary recommendations were based upon the patient's metabolic type. Nutritional supplementation included Para Pack, a synergistic metabolic formulation as well as specific vitamin and mineral supplements based upon the HTMA pattern. Minerals were full spectrum amino acid chelates.

The patient's follow-up HTMA patterns revealed a marked and continous rise in calcium to over 300mg% and the copper level rose to over 4.8mg% (figure 4). The rise in these elements is not unusual and is expected. As excessive tissue calcium is mobilized from soft tissues HTMA levels frequently increases before returning to normal values. Excessive tissue accumulation of copper also often increases as it is being mobilized and excreted from tissue and organ storage sites. Nutritional rec-

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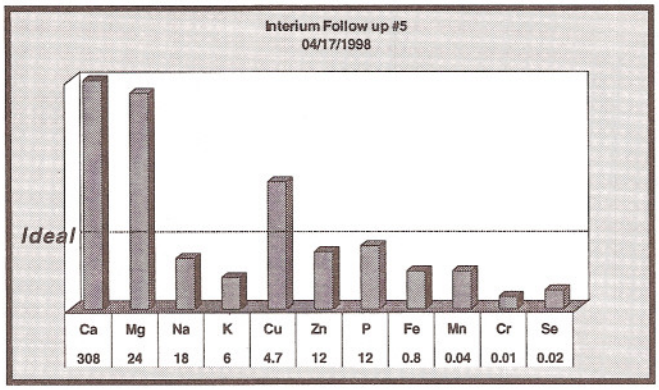
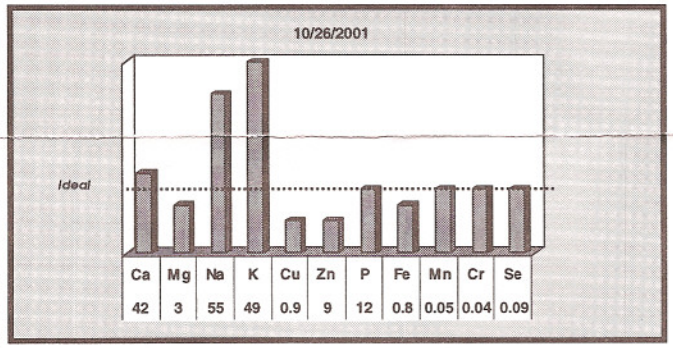
Figure 4

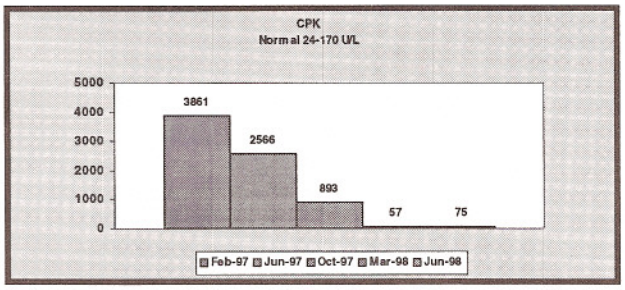


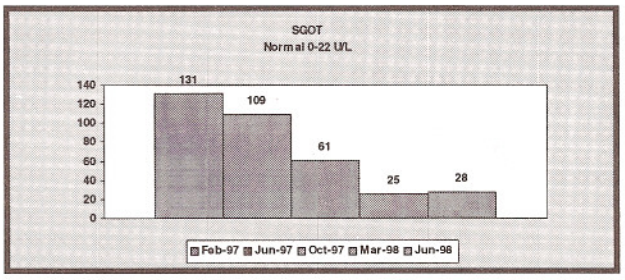
ommendations and supplement recommendations were modified based upon changes in each of the patient's HTMA pattern

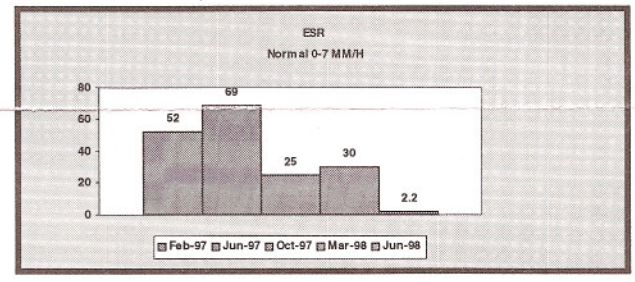
The following graph (figure 5) show the patient's current HTMA pattern as of Oct. 2001.

Figure 5









Over the course of nutritional therapy and dietary modification based upon follow-up HTMA test the patients CPK levels showed improvement with each test and returned to within normal limits by March of 1998. Other blood parameters improved significantly as well.

Currently the patent is enjoying a normal and productive lifestyle. Her skin is almost totally back to normal except for some areas on the forearms. Dexterity in her hands has improved to the point that she has regained her ability to crochet.

Discussion

We cannot specifically recognize what triggered this patients' autoimmune response, however from the HTMA study we can recognize several factors that may have contributed. The nutritional mineral imbalances are obvious from the HTMA laboratory results and nutritional balance is well recognized as an important part of normal immunity. The patient is a mother and could have fetal cells present although this was undetermined. Stress is certainly part of the puzzle whether brought on by the disease itself, or preexisting. The low Zn/Cu ratio and eventual manifestation of excess tissue copper indicates that estrogen may have been dominant and therefore, a triggering factor. The marked elevation of calcium in a parasympathetic pattern suggests the presence of an underlying viral condition. Tissue calcium as well as copper is known to rise following a viral event. Excess tissue calcium is known to activate dormant viruses as well. Determination of an underlying virus was not ascertained.

The resulting decrease in tissue calcium and normalization of the Zn/Cu ratio indicates a reduction in the patient's hyperactive cellular immune response. The rise in sodium and potassium indicates an adrenal response, which has a number of effects. A normal adrenal response is necessary for recovery form most cellular autoimmune conditions in that adrenal hormones enhance the ability of the body to recognize and respond to the condition. The adrenals initiate an alarm response and aids in the progression to resistance and recovery. The adrenal hormones also suppress thymus overactivity thereby reducing autoimmune activity. It should be obvious that further thymus support in patients with this HTMA pattern would be detrimental.

We have classified a number of conditions into sympathetic and parasympathetic categories including the humoral and cellular immune dominance based upon HTMA patterns. These are listed below. This is actually an on-going process as our continuing research involves HTMA pattern recognition and disease processes. Table 2 is a list of conditions categorized predominantly into sympathetic (Fast Metabolic category) and parasympathetic (Slow Metabolic category) incidence. From this partial list we can see that many health conditions may have an underlying immune component.

Conclusions

HTMA may serve as an economical screening tool for assessing the nutritional and immune status of individuals as well as distinguishing which branch of the immune system is dominant. With this understanding we can no longer address a person's immune status generally and simply provide a broad spectrum immune support. We must first distinguish what branch of the immune system is involved and proceed accordingly. Nutritional and dietary management can be made more specific based upon individual assessment and requirements.

Table 2

Disease Manifestation

Sympathetic (Humoral Immune Dominance)	**Parasympathetic** (Cellular Immune Dominance)
Anxiety	Arthritis (osteo)
Arthritis (Rheumatoid)	Allergies (Low Histamine)
Allergies (Histamine)	Allergies (Ecological)
Amyotrophic Lateral Sclerosis	A.I.D.S.
Malignancies (Metastatic)	Malignancies (Tumors)
Hyperactivity	Anorexia
Diabetes (Hypoinsulinemia)	Diabetes (Hyperinsulinemia)
Hypertension	Hypotension
Hyperthyroidism	Hypothyroidism
Hyperglycemia	Hypoglycemia
Hypoparathyroidism	Hyperparathyroidism
Hyperadrenia	Hypoadrenia
Infections (Bacterial)	Infections (Viral)
Multiple Sclerosis (Type I)	Multiple Sclerosis (Type II)
Manic Depression	Depression
Osteoporosis (Type I)	Osteoporosis (Type II)
Parkinson's Disease	Sjogrens Syndrome
Ulcers (duodenal)	Ulcers (Gastric)
Post Menstrual Syndrome	Premenstrual Syndrome
Seizures	Chronic Fatigue Syndrome (CFS)
Cystic Fibrosis	Lupus
	Scleroderma
	Gallstones
	Yeast (Candidiasis) Fungus
	Endometriosis

Note: Disease may manifest in either metabolic group, but are found predominantly in above categories.

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