InterClinical Laboratories
Newsletter

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Clinical Updates for the Health Professional

In this newsletter, we continue to provide professional, clinical information with a special 'immune' edition of the Clinical Updates, as well as continuing our Additional Elements series with Part 5: Lithium.

Our biggest news this month is the beginning of our 2012 Seminar Series! We are launching the seminar series in Brisbane on the 19th and 20th of May and will be following up in Melbourne, Perth, Sydney and Adelaide throughout June. We haven't forgotten our New Zealand friends; we will be heading to Auckland in late August.

This year we are covering an essential area of health concerns; ***Autoimmune Disease – How to more effectively manage, treat and correct autoimmune conditions with natural and nutritional medicines.*** Conditions such as Multiple Sclerosis, Arthritis, Coeliac Disease and allergies are all on the rise and more people are presenting with these conditions to natural medicine practitioners like you. Autoimmune conditions can be complicated by a number of factors – internally and externally – and hence they can be daunting to treat. In this series, we will be breaking them down into manageable situations by highlighting the nutritional imbalances that contribute, as well as detailing the essential herbal and homeopathic treatment strategies.

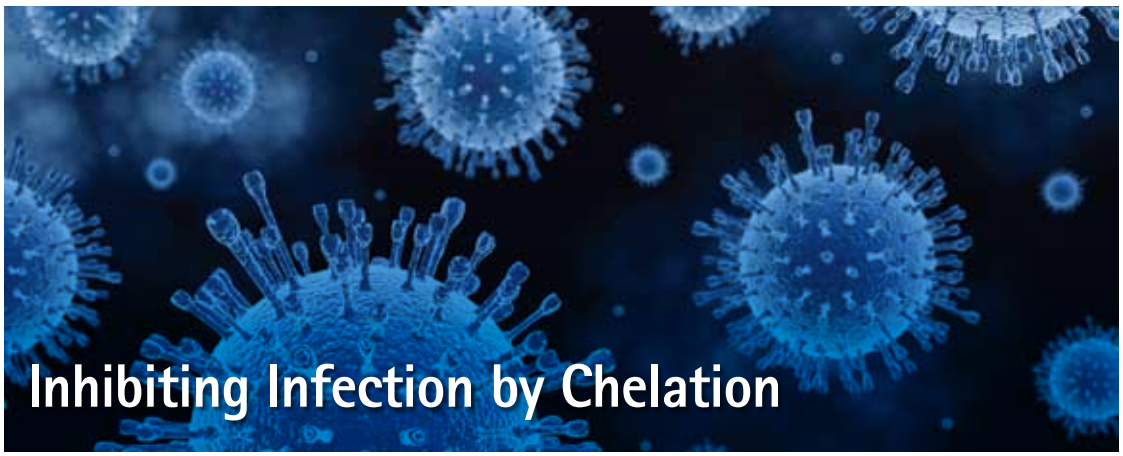
InterClinical Laboratories is proud to be host to our guest speaker for 2012, Reine DuBois, ND. Reine is not only a Naturopath and Homeopath running a busy clinic in northern NSW, but she is also the CEO of a new project; IMedicine, Australia's first integrated hospital. Reine brings her years of clinical experience with autoimmune conditions to this seminar, so don't miss out!

To register for our 2012 Seminar Series, complete the registration form included with this newsletter, or alternatively go to www.interclinical.com.au and click 'events' to register online.

Early bird prices are available for a short time, so book in quickly!

Yours in health,

The Team at InterClinical Laboratories.



Inhibiting Infection by Chelation

Abscesses form when invading bacteria meet cells of the immune system, most notably neutrophils. These abscesses help confine the spread of infection by restricting microbial growth, but the specific host factors involved in the process have not been well defined. In a report from *Science*, Corbin et al. (15 Feb, 2008) identified a neutrophil protein, calprotectin, as an important inhibitor of bacterial growth inside abscesses. This protein is involved in signalling other immune cells after tissue damage or inflammation occurs. According to the study, calprotectin also defends against infection by chelating manganese and zinc ions – metals required by the human pathogen *Staphylococcus aureus* for growth and for counteracting immune attack. The researchers showed that infected mice lacking calprotectin had elevated metal levels and increased bacterial growth in tissue abscesses. Inhibition of bacterial nutrient uptake may thus represent a promising new area of research for the design of antimicrobial therapeutics.

As noted in an accompanying *Perspective* by R.P. Novick, however, whether it is possible to reduce an essential trace metal to a concentration low enough to block bacterial growth without also compromising the functions of host cells remains to be seen.

Multiple Sclerosis and Vitamin D

Studies have shown that elevated circulating levels of vitamin D may be associated with a reduction in the risk of developing multiple sclerosis (MS). The relationship is based upon the global distribution of MS occurrence with increasing latitude north and south of the equator. The assumption is that latitudes of 42 degrees or more results in seasonal variation of vitamin D status. Specifically a reduction in vitamin D status would be due to less UV-B rays being available during winter months.

Munger, KL, et al. Serus 25-Hydroxyvitamin D Levels and Risk of Multiple Sclerosis. JAMA, 296, 23, 2006.

Comment: The mechanism of the potential benefit for vitamin D and its role in reducing the risk for development of MS can be explained through HTMA studies. Vitamin D has immunomodulating effects and specifically acts on the mineral calcium. Typically we see that MS occurs most often in the Fast Metabolic Types who have low tissue calcium, magnesium and copper in conjunction with elevated sodium and potassium along with relative phosphorus dominance. This HTMA pattern is associated with a humoral immune dominance and an increase in the vitamin D requirements. Increasing vitamin D intake for an individual with this HTMA pattern would have a number of beneficial effects. First, vitamin D enhances calcium absorption and retention. This would bring about a reduction in elevated sodium and potassium levels, thereby reducing the excessive humoral immune response. Vitamin D would also act as a copper-sparing nutrient, the mineral necessary for normal myelin formation. Vitamin D would therefore also enhance associated antioxidant activity most notable superoxide dismutase (SOD). Of course there are many other mechanisms involved that are too numerous to mention in this brief description. HTMA studies have revealed other health conditions that would also respond to vitamin D therapy such as Parkinson's disease, ALS , Type I Diabetes, metabolic syndrome, etc.

Autoimmune Disease and Sex Hormones

In past TEI Newsletters we have discussed the increased incidence of cellular autoimmune disease in women compared to men. The mechanism is reflected in hair mineral patterns and is closely associated with oestrogen. A recent article appearing in the Archives of Dermatology discusses the relationship between oestrogen and Lupus, an autoimmune condition more prevalent in women than men. Lupus incidence dramatically increases in women following puberty and diminishes following menopause. The condition varies in severity throughout the menstrual cycle and during pregnancy, thus reflecting an association with oestrogen fluctuations. Controlled trials using opposing hormones have shown a decrease in flare-ups and a reduction in corticosteroid requirements. The study suggests that in the future, hormonal therapy may be used therapeutically in controlling and altering the disease cause, rather than just treating its symptoms

Sex Hormones and the Genesis of Autoimmunity, Ackerman, L. Arch. Dermatol. 142, 2006.

Thyroid Function Improves with Adrenal Support

We have often written about the endocrines, particularly their antagonistic and synergistic relationships. As you may know, through our research and HTMA studies, we have been able to classify the individual endocrines into Sympathetic and Parasympathetic categories. It is apparent from these HTMA studies that a synergistic relationship exists between the adrenal and thyroid glands. Typically when thyroid function is decreased, adrenal function follows suit. Conversely, when thyroid function is elevated adrenal activity is also increased. Unfortunately, we often see individuals who have been on long-term thyroid replacement therapy with little evidence of their effectiveness. This lack of appropriate response may be explained by this thyroid-adrenal relationship.

A number of cases have been reported of individuals having signs of hypothyroidism with elevated TSH, and low free thyroxine concentration in conjunction with adrenal insufficiency. Adrenal hormone support resulted in normalization of thyroid function without any type of thyroid support.

Abdullatif, HD, et al. Reversible Subclinical Hypothyroidism in the Presence of Adrenal Insufficiency. Endocrin. Pract. 12,5, 2006.

Candrina, R, et al. Addison's Disease and Corticosteroid-Reversible Hypothyroidism. Endocrinol. Invest. 10,5,1987.

Comment: This finding supports our conclusions from HTMA studies of the thyroid-adrenal relationship. Often, thyroid support alone does not aid in improving metabolic activity unless adrenal support is initiated. Many individuals who have been diagnosed and treated for hypothyroidism may in fact be suffering from adrenal insufficiency and therefore, thyroid replacement therapy may often be unwarranted.

Part Five of HTMA and the Lesser Known Trace Minerals

3

Li

Lithium

6.941

Lithium

Chemical Structure

Lithium is a soft, silver-white lustrous metal that belongs to the alkali metal group of chemical elements. Lithium is a moderately abundant element in the Earth's crust in approximately 65ppm (parts per million).[1] Under standard conditions it is the lightest metal and the least dense solid element. Like all alkali metals, lithium is highly reactive, extremely flammable and reacts with water. In many of its properties, lithium exhibits the same characteristics as do the more common alkali metals sodium and potassium.[2] Because of its high reactivity, lithium never occurs freely in nature, and instead only appears in

compounds which are usually ionic. Well known forms of lithium include; lithium hydroxide (LiOH), lithium stearate ($LiC_{18}H_{35}O_2$) and lithium carbonate (Li_2CO_3).

Sources

Most lithium is recovered from brine, or water with a high concentration of lithium carbonate. Brines trapped in the Earth's crust (called subsurface brines) are the major source material for lithium carbonate.[3] Trace amounts of lithium are present in all organisms.[4] There are no apparent vital biological functions of lithium, since animals and plants survive in good health without it. Given that lithium demonstrates no clear biological role, lithium-based compounds such as lithium carbonate (Li2CO3), have been shown to exhibit a pharmacological effect in the body if taken orally.[5] The lithium ion Li+ taken as any of several lithium salts has proved to be useful as a mood-stabilizing drug due to neurological effects of the ion in the human body.[6]

Environment

Lithium is widely distributed but does not occur in its free form and makes up only 0.0007% of the earth's crust.[7] It is found in small amounts in practically all igneous rocks and in the waters of mineral springs. The minerals that contain lithium include lepidolite, petalite, amblygonite, and spodumene. The widespread occurrence of lithium in plants results in a wide, although low-level, distribution of lithium in animals. Lithium is found in trace amount in numerous plants, plankton, and invertebrates, at concentrations of 69 to 5,760 parts per billion (ppb).[8] Lithium salts have complex effects when absorbed in the body, they are not highly toxic, although high levels can be fatal.[9] Lithium is taken up by all plants, although it appears not to be required for their growth and development.[10]

Diet

Lithium is found in variable amounts in foods. Primary food sources are grains and vegetables which may contribute from 66% to more than 90% of the total lithium intake; the remainder is from animal-derived foods in some areas. Other food sources rich in lithium include all kinds of dairy products, sugarcane, seaweed, potatoes, lemons, mustards, sardines and eggs. In general, diets rich in grains and vegetables may be expected to provide more lithium than diets rich in animal proteins. Drinking water also provides significant amounts of this element. Human dietary lithium intake depends on the location and the type of foods consumed with the average daily intake for an adult human ranging from 650 to 3100 µg.[11]

Absorption and Excretion

Lithium is normally present in all organs and tissues. Lithium is absorbed from the small intestine via sodium channels and is excreted primarily by the kidneys and in faeces. Absorbed lithium is uniformly distributed in body water, with only a small difference between the extracellular and intracellular levels. Upon ingestion, lithium becomes widely distributed in the central nervous system and interacts with a number of neurotransmitters and receptors, decreasing norepinephrine release and increasing serotonin synthesis.[12]

Functions and Applications

Many uses have been found for lithium and its compounds. Lithium has the highest specific heat of any solid element and is used in heat transfer applications. It is used as an alloying agent, in synthesizing organic compounds, and is added to glasses and ceramics. Lithium is the lightest known metal and can be alloyed with aluminium, copper, manganese, and cadmium to make strong, lightweight metals for aircraft. Lithium hydroxide (LiOH) is used to remove carbon dioxide from the atmosphere of spacecraft. Lithium stearate ($LiC_{18}H_{35}O_2$) is used as a general purpose and high temperature lubricant. Because of its light weight and large negative electrochemical potential, lithium metal, either pure or in the presence of other elements, serves as the anode (negative electrode) in many non-rechargeable lithium primary batteries.

It is not known whether lithium has a physiological role in plants or animals, but nutritional studies in mammals have indicated its importance to health, leading to a suggestion that it be classed as an essential trace element at a daily intake of 1mg/day.[13] At this dose, lithium is considered non-toxic, stimulatory and has an anti-depressant effect.[14] Lithium is thought to stabilize serotonin transmission in the nervous system; it influences sodium transport; and it may even increase lymphocytic (white blood cell) proliferation and depress the suppressor cell activity, thus strengthening the immune system.[15] Lithium carbonate (Li_2CO_3) is a psychotropic drug used to treat recurrent manic depression disorder.[16] It has also been shown to help correct sleep disorders in manic patients, apparently by suppressing the rapid eye movement phases of sleep.[17]

Toxicity and Excess

Excess lithium may be associated with therapeutic lithium treatment and can interfere with iodine uptake by the thyroid gland and block thyroxine or thyroid stimulating hormone (TSH) release.[18] Excess lithium produces symptoms such as nausea, diarrhoea, excessive thirst, increased urination, hand and foot tremors, lethargy, mental confusion, delirium and weakness in muscles.[19] Lithium is known to alter the intra to extra-cellular potassium ratio which may result in a loss of intracellular potassium and contribute to hyperkalemia.[20] Other conditions associated with chronic lithium accumulation include; hair loss, Diabetes insipidus, Hypothyroidism, weight gain, Osteoporosis, fatigue, Gioter, Leukocytosis and Eosinophillia.[21] Hypothyroidism is a well known side effect of lithium excess. The thyroid is inhibited by the lithium induced hyperparathyroid activity and can therefore result in elevated serum calcium and reduced serum phosphorus.[22] Lithium found in vegetables and other foods appears to be non-toxic. The lithium found in natural lithium supplements such as lithium orotate or lithium aspartate also appears to be completely harmless. In contrast, the high-dose lithium carbonate has been shown to be toxic.[23]

Analysis in HTMA

Lithium is analysed and measured in HTMA as a trace mineral element. In HTMA, low levels below 0.001ppm, may not be of any clinical significance. The presence of elevated levels above 0.009 ppm may correlate with previous exposure from an external source, either from the environment or from over supplementation. Higher levels of lithium in HTMA may be of some clinical significance due to lithium's interaction with other minerals, namely the other electrolyte minerals; calcium, magnesium, sodium and potassium.

PRACTITIONER SEMINAR SERIES 2012 - HAIR TISSUE MINERAL ANALYSIS

AUTOIMMUNE CONDITIONS IN CLINIC

How to more effectively manage, treat and correct autoimmune conditions with natural and nutritional medicines.

SUMMARY SEMINAR OUTLINE:

HTMA Primary Course (Saturday)

Introduction to HTMA in Clinical Practice

- Minerals and health
- Toxic and heavy metals
- Significant nutrient relationships
- Importance of mineral ratios
- Nutritional imbalances
- Metabolic typing
- HTMA case studies

HTMA Advanced Course (Sunday)

Autoimmune Disease and Natural Medicine

- Fibromyalgia, Chronic Fatigue Syndrome (CFS)
- Coeliac Disease
- Systemic lupus erythematosus (SLE)
- Allergies (seasonal, skin), Chemical Sensitivity
- Thyroid Conditions (Hashimoto's, Graves')
- Multiple Sclerosis, Arthritis
- Mineral/Nutritional Imbalances
- Case Studies and practical clinical examples

PRESENTED BY:

Zac Bobrov
Technical Director,
InterClinical Laboratories

Reine DuBois Dip ND, Dip HOM
Naturopath, Homeopath,
Clinic Director and CEO of
IMedicine

SEMINAR DATES & VENUES:

Brisbane:	19th & 20th May 2012	Holiday Inn
Melbourne:	2nd & 3rd June 2012	Crowne Plaza
Perth:	9th & 10th June 2012	Novotel Perth
Sydney:	16th & 17th June 2012	Vibe Hotel
Adelaide:	23rd & 24th June 2012	Crowne Plaza
Auckland:	18th & 19th August 2012	Mercure Hotel

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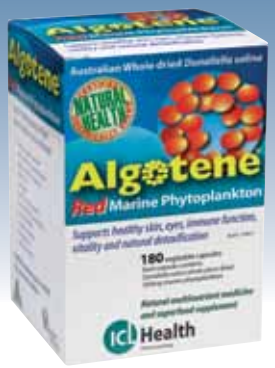

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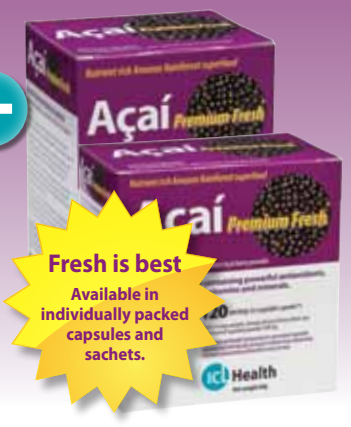

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