From "Nutritional Medicine: Fact v Fiction"
by Dr Igor Trabizian MBBS UWA Published 2002

comes down to tissue mineral analysis. What tissue? Hair.
Yes, the answer came down to hair analysis. So then I started doing hair analysis and started getting some real answers. However these created even more questions as to the real effect of the environment on our health. Yes, indeed there were Antinutrients blocking the effect of the nutrients and the identification of these "hidden" enemies filled in the missing pieces of the nutritional puzzle.

This work linked directly with the work of Dr. John R Lee who noticed that oestrogen excess or progesterone deficiency could lead to copper excess, low zinc and magnesium. This linked to studies that showed how pesticides, plastics, petroleum products and ingested hormones from food lead to the accumulation of false Estrogens which in turn cause high copper, low zinc and low magnesium. We've all had exposure to these long lasting poisons. This linked to work done on personality and mental disorders by Dr. John Walsh. It confirmed my suspicion that diagnoses like ADD were becoming epidemic as a result of these mineral imbalances.

Then the horror and the extent of the disaster were obvious. Through environmental poisons, farming malpractice, prescription drug administration and the Helicobacter epidemic (15% of the world's population), the picture was complete. We are killing ourselves, with the encouragement of the Health Insurance Commission and our government. We are all sick of it and now we want answers.

Chapter 1.

Zinc, zinc, my kingdom for some zinc.

Zinc is important for so many enzyme systems ranging from liver function to DNA synthesis, serotonin production (mood chemical), sex hormone production, insulin production, stabilisation of mast cells (these cause itching when they release histamine); immune function and preventing free radical build up. Most of the cancer patients I see have low zinc levels. Zinc deficiency is associated with diabetes, raised cholesterols, heart disease, anorexia, allergies, recurrent infections, delayed wound healing, arthritis, hair loss, pimples, eczema, infertility, depression, insomnia, learning disorders, and hyperactivity in children.

A mid-summer's night zinc deficiency

Zinc sits between copper and gallium and above cadmium and mercury on the periodic table. Unfortunately it's all bad news when it comes to this mineral. A detailed list of foods that contain zinc will show just how unplentiful it is compared with iron or calcium and to compound the problem is the variation of zinc levels in soils where such products are grown. Zinc is the cornerstone of many nutritional deficiencies because it is required for making stomach acid. No, despite what you hear from the medical profession, stomach acid is a good thing to have. Humans have had lots of stomach acid for thousands of years until recently. Now we are finding that hypochlorhydria (low stomach acid) is associated with many medical problems. Low stomach acid starts a chain of events, which eventually disable correct nutrition.

The body absorbs zinc by producing an acid called picolinic acid. This is released by the pancreas during meal times and binds zinc (along with several other trace elements) to facilitate its

absorption. Problems occur because the amount of this acid is reduced if stomach acid is low. This leads to an eventual spiralling drop in zinc levels, which is insidious. The irony is that if you can't produce stomach acid your pancreas won't help you absorb zinc and if you can't absorb zinc, you can't make stomach acid.
The next problem is what does a plant include in its structure if it can't get enough zinc? Plants can grow in zinc and selenium deficient soils without apparent change in appearance. Unfortunately, trace element substitution can occur, which will fill up zinc's "spot" with some other mineral. There is concern that superphosphates contain cadmium (15-21mg per kg as a contaminant) and that cadmium will substitute for zinc. Cadmium is a toxic heavy metal.

Now the really bad news. It is possible that not only could one consume foods that are low in zinc, and not be able to absorb them, but also worst of all they may contain a toxic heavy metal such as cadmium or mercury or other minerals such as copper. Now you see the problem with zinc's position in the periodic table (location, location, location!). Moreover, if the body accumulates copper as a result, this will further inhibit the absorption of zinc. Cadmium competes for absorption with zinc also. Cadmium has been implicated in the genesis of prostate cancer and atherosclerosis.

What about losses of zinc? Zinc is secreted into body fluids as an antiseptic. That's why low levels are associated with sore throats, lung infections, gastroenteritis, ulcers, urinary tract infections and thrush. Diuretics (things that make you go to the toilet) lower zinc levels. This includes the ACE inhibitors (Captopril, Enalapril etc.), Lasix (and other diuretics), coffee, tea, alcohol and even the food additive Tartrazine (additive 102, which is

just about everything yellow, green or orange in this country). Some people sweat zinc as zinc chloride. This explains why levels may be lower in summer (hence the comment about mid-summer deficiency).

Then there's the problem of zinc storage. The syndrome of Estrogen dominance (where there is an apparent lack of progesterone or an inappropriately high oestrogen level) has been associated with low zinc levels.

The combination of all the above factors (availability, soils, contaminants, digestion, losses and storage problems) accounts for the high prevalence of zinc deficiency.

A pound of flesh yields much zinc.

Yes, animal flesh contains plentiful, easily absorbed zinc. So what are the common manifestations of zinc deficiency? Zinc falls during the day and so low levels are often encountered in the late afternoon. Hypoglycaemia (low blood sugars) usually develops 2-3 hours after a meal, so the first hypo's begin about 3-4 pm when the patient looks for a sugar fix. The next spot is about 10:30 – 11 am. Those with low zinc tend to need to eat frequently. It may cause poor concentration or mental apathy. Low zinc's are associated with sleep disturbance. If the body runs low on zinc, the first symptoms may be a disrupted sleep pattern, or circadian rhythm disturbance. These people have poor sleep patterns.
Then, there's the problem of allergies, eczema/dermatitis, hay fever, and asthma. Zinc deficiency is associated with depression and disrupted sleep cycles, because you need it to make serotonin (your happy chemical) and melatonin (your sleep chemical). See the figure below to see where zinc fits into the picture.
When could such a deficiency start- at birth?

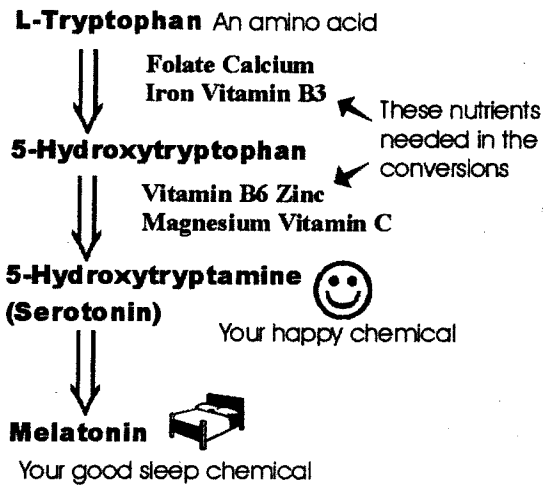

Fig. 1. How to make serotonin and melatonin

The seven ages of man. What it is to have a life without zinc.

Let's take the example of mother and baby with zinc deficiency. Mother has become depleted in zinc during pregnancy and maybe breastfeeding. Her low zinc has produced problems with her brain making the happy chemical serotonin (post natal depression). She is also low in melatonin (your sleep chemical), which the next step down from serotonin. Baby is low in zinc and develops hypoglycaemia. Baby needs extra frequent feeds and is either a reflux baby or a colicky baby (low stomach acid leads to poor digestion). Baby also can't sleep properly (low melatonin).

Some manifest as allergies such as eczema or hay fever. Ironically, the parents may start to exclude dairy products in an effort to reduce "dairy induced mucus" symptoms, but dairy products are the main source of zinc for a child.

Next, come the frequent colds, sore throats and ear infections

especially during times of growth spurts (increased DNA synthesis for growing puts pressure on zinc stores) or the skin will flare up from eczema, thrush or warts (viruses don't like zinc). If the eczema gets infected, they can't mount an effective immune reaction and so secondary infection (Staph or fungus) will complicate the issue and confuse the doctor who uses cortisone creams, because on the one hand they suppress the eczema and fungal infection, but they will aggravate any bacterial infection. Zinc deficiency may manifest in the lung and cause "asthma".

These children are usually fussy eaters. They lose the sense of smell and so are reliant upon taste (salt, sweet, sour or bitter). In the case of vegetables, they tend to like peas or carrots (because they can taste the sweetness) but avoid other vegetables with innate bitterness that would normally be masked by the aroma (smell) of the plant. These children also have low stomach acid, which might make them sensitive to acidic foods such as grapes, citrus and tomatoes. These foods will either give them headache (mummy, my head's sore) abdominal pains (mummy, my tummy's sore), skin problems (mummy, I'm itchy) and poor sleep (mummy, can I sleep in your bed?). They will either be hyperactive or moody, and suffer the hypoglycaemia effects with features such as pre-dinner tantrums and temper outbursts. They often have a persistently runny nose, but react strangely to antihistamine medications.

Later they may develop anorexia/bulimia, acne or teenage depression. If they are infected with the glandular fever virus, they will not recover quickly and have a high chance of developing chronic fatigue syndrome. If they have a baby, then the cycle starts all over again. Later, in life they will have a higher chance of diabetes, raised cholesterol, arthritis, depression and cancer. Alas poor Yorick.

Zinc, zinc, where art thou zinc?

A word of warning, don't expect your doctor to believe that zinc deficiency exists. They were taught that people on a good diet could never become zinc deficient. What they weren't taught is that we have a problem with soil depletion; digestive problems or excessive losses which can lead to clinical zinc deficiency, but it won't show up in the serum zinc level. It will, however it may show up in the RED CELL ZINC level or in hair analysis. Zinc is an intracellular molecule. It exhibits the pattern of deficiencies typical of these, in that one can become deficient without it showing up in a blood test. An editorial in the British Medical Journal suggested that the best way to diagnose zinc deficiency was to give a trial of zinc!

References:

General works on Zinc

1] Pfeiffer, C Zinc and other micronutrients New canan CT Keats 1978

2] Powell, S. R. The antioxidant properties of zinc. Journal of Nutrition. 130(5):1447S-1454S, 2000.

3] Prasad,et al Biochemistry of Zinc New York Plenum press 1993

4] Prasad, A Trace elements in human health and disease. Vol 1 Zinc and Copper New York Academic press 1976

5] Sanstead, HH Zinc in Human Nutrition: Disorders of mineral metabolism Vol 1 Academic press NY 1981

6] Watts, D The Nutritional relationships of Zinc J Ortho Med 2: 99-108 1989

Cancer and Zinc (also, see chapter on cancer)

7] Munoz, N., et al, Effect of riboflavin, retinol, and zinc on the micronuclei of buccal mucosa and of esophagus: A randomized double-blind intervention study in China. J Nat Cancer Inst. 79:687-691 1987

8] Tvedt, K. E., et al, Intracellular distribution of calcium and zinc in normal, hyperplastic, and neoplastic human prostate: x-ray microanalysis of freeze-dried cryosections. Prostate. 15:41-51 1989

9] Leake, A., et al, Subcellular distribution of zinc in the benign and malignant human prostate: evidence for a direct zinc androgen interaction. Acta Endocrinol (Copenhagen). 105:281-288 1984

Heart disease, Cholesterol and Zinc

10] Freeland-Graves, J. H., et al, Effect of zinc supplementation on plasma high-density lipoprotein cholesterol and zinc. Am J Clin Nut 35:988 1982

11] Addis, P. B., et al, Atherogenic and anti-atherogenic factors in the human diet. Biochem Soc Symp. 61:259-271 1995

12] Singh, R. B., et al, Current zinc intake and risk of diabetes and coronary artery disease and factors associated with insulin resistance in rural and urban populations of North India. J Am Coll Nutr. 17:564-570 1998

13] Sparkman, D., Zinc: lowers risk of heart disease, diabetes. Muscular Development. 36(6):44 1999

Immune System and Zinc

14] Editor : Another look at Zinc. Br Medical Journal 282:1098-99 1981

15] Eby, G. A., et al : Reduction in duration of common colds by zinc gluconate lozenges in a double-blind study. Antimicrobial Agents and Chemotherapy. 25:20 1984

16] Mossad, S. B., et al: Zinc gluconate lozenges for treating the common cold. A randomized, double-blind, placebo-controlled study. Ann Int Med. 125(2):81-88 1996

17] Novick, S.G., et al: How does zinc modify the common cold? Clinical observations and implications regarding mechanisms of action. Med Hypotheses 46(3):295-302 1996

18] Duchateeau, J., et al: Influence of oral zinc supplementation on the lymphocyte response to mitogens of normal subjects. Am J Clin Nutr. 34:88-93 1981

19] Duchateau, J., et al: Beneficial effects of oral zinc supplementation on the immune response of old people. Am J Med. 70:1001-1004 1981

20] Ripa, S.et al: Zinc and the elderly. Minerva Med. (6):275-278 1995

21] Hadden, J. W: The treatment of zinc deficiency is an immunotherapy. International Journal of Immunopharmacology. 17(9):697-701 1995

Allergy and Zinc

22] Marone, G et al: Physiological concentrations of zinc inhibit the release of histamine from human basophils and lung mast cells. Agents Actions. 18:103-106 1986

23] Rogers , SA Zinc deficiency as a model for developing chemical sensitivity Int Clin Nutr Rev 10(1):253-59 1990

Hormones and Zinc

24] Chuong C J & Dawson EB: Zinc and copper levels in premenstrual syndrome. Fert. Steril Aug 62:2, 313-20 1994

25] Haglund et al : Evidence of a relationship between childhood onset type 1 diabetes and low groundwater concentration of zinc. Diabetes Care Aug 19:8 873-5 1996

26] Nishiyama S. et al: Zinc supplementation alters thyroid hormone metabolism in disabled patients with Zinc deficiency. J Am Col Nut 13(1):62-67 1994

The Brain, the Senses and Zinc

27] Arnold et al Does hair zinc predict amphetamine improvement of ADD/hyperactivity? Int J Neuroscience 50:103-107 1990

28] Bakan, R., : The role of zinc in anorexia nervosa: Etiology and treatment. Medical Hypotheses. 5:731-736 1979

29] Bekaroglu et al Relationships between free fatty acids and zinc, and attention deficit hyperactivity disorder: a research note J Child Psychol Psych 37:225-227 1996

30] Esca, S. A., et al: Kwashiorkor-like zinc deficiency syndrome in anorexia nervosa. Acta Derm Venereol. Stockholm. 59:361-364 1979

31] Heyneman C.A.: Zinc deficiency and taste disorders. Ann Pharmacotherapy Feb 30:2 186-7 1996

32] Horning, M. S., et al. Endogenous mechanisms of neuroprotection: role of zinc, copper, and carnosine. Brain Res. 852(1):56-61, 2000.

33] McClain, C. J., et al: Zinc deficiency in the alcoholic: A review. Alcoholism: Clin Exp. 7:5 1983

34] McLoughlin, I. J., et al: Zinc in depressive disorder. Acta Psychiatrica Scandinavica. 82(6):451-453 1990

35] Mocchegiani, E., et al: The zinc-melatonin interrelationship: A working hypothesis. Ann NY Acad Sci. 719:298-307 1994