# The Role of HTMA in 'Unexplained Infertility'

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Hair Tissue Mineral Analysis (HTMA) is a recognised pathology screening method to assess trace minerals, toxic elements and heavy metals. HTMA has become a valuable clinical tool to give clinicians insight into 'unexplained infertility' cases.

In Australia, we continue to see a growing incidence of infertility due to a number of physiological and pathological causes, which is believed to affect both genders of the population. Evidence is showing that infertility, miscarriage, premature birth and poor health in the neonate can be attributed to poor nutrition and nutritional imbalances. When treating the client, we must never lose focus of the vital role of minerals and nutrition in maintaining the balance of good health. The value of using HTMA as a screening tool in providing invaluable insights into your clients' nutritional and mineral balance can not be understated. Only when a cause can be identified, can we offer the optimum solution to correct such imbalances in an effort to restore overall health and to achieve the most desirable therapeutic outcomes for the client.

## Minerals and Infertility

**Copper:** One of the most common mineral imbalances contributing to infertility involves copper.[1] Both an excess and or a deficiency can interfere with pregnancy, foetal health and development. Copper can be stored in excessive amounts in cells, organs and tissue thus producing symptoms of toxicity leading to possible deformities in the foetus such as growth retardation, smaller than normal brain, may suffer from a fragile skeletal structure and anaemia. Women can accumulate copper from taking oestrogen hormone replacement or the oral contraceptive pill. Copper is synergistic with oestrogen and oestrogen encourages an increase in copper tissue levels and copper toxicity may be linked to the promotion of oestrogen dominance. This may directly affect infertility rates by lowering progesterone levels resulting in annovulation, implantation failure or luteal phase deficits. Copper has also been shown to block the absorption of many essential minerals directly involved with reproductive pathways, especially zinc. Copper ions are bound to metallothionen with a greater infinity than zinc, so often zinc deficiencies occur in direct titre to copper levels. Zinc deficiency affects various processes involving both male and female reproduction, despite copper toxicity being more common in females.

**Zinc:** Low and deficient zinc levels in women may cause deterioration in oocytes and in severe cases causes' annovulation.[4] Zinc deficiency has been associated with miscarriage, failure of implantation, intrauterine growth retardation and an increase in the incidence of congenital malformations. In clinical studies, men with low zinc levels also experienced a decrease in both serum testosterone levels and dihydrotestosterone levels. Zinc supplementation was shown to improve overall fertility rates.[4]It appears that low or deficient zinc impairs the absorption of folic acid which may be linked to an increased incidence of Neural Tube Defects. Copper toxicity can be readily detected on a HMTA by a zinc to copper ratio that is less than 6:1.[3] This may be accompanied by a slow oxidation rate and several other abnormal mineral ratios.[6]

**Iodine:** Pregnancy and lactation increase the requirements for iodine. Iodine is one of the most common nutrient deficiencies that is evident in the world today.[2] Common outcomes of deficiency in neonatal health include cretinism, mental retardation and hypothyroidism. This emphasises the important role that any iodine can play as an integral part of preconception care.

**Selenium:** Selenium is a mineral essential for growth and also plays a vital role in male fertility. Selenium absorption is blocked by many toxic metals such as cadmium, mercury and arsenic.[3] Deficiency in the levels of selenium has been shown to cause a reduction in testosterone secretion and also an increase in abnormal sperm count and reduced motility. Supplementation may improve overall results and was found to be more effective than if Vitamin E was supplemented concurrently.[4]

**Chromium:** Chromium levels have been shown to be reduced during pregnancy and with oestrogen hormone replacement, thus increasing insulin secretion and impairing glucose tolerance. Deficiency states in preconception due to poor nutrition and dietary inadequacies can create the foundation for potential dysglycemia. This may potentially result in fluctuating blood sugar levels in the neonate and a predisposition in the development of gestational diabetes. Chromium is vital for cellular structure and studies have shown the necessity of chromium for foetal growth and development and maintaining normal sperm counts.

**Magnesium:** Adrenal insufficiency and prolonged stress impairs the body's ability to utilise magnesium and toxic heavy metals such as cadmium block the absorption and utilisation of magnesium. Magnesium deficiencies have also been linked to congenital abnormalities in the normal development of the foetal heart, uterine spasms and pre-term labour.

**Manganese:** Manganese levels are often low on the HTMA analysis where there is a copper excess in your client. Oestrogen is synergistic to copper at the detriment of many nutrients including manganese. Thyroid function also requires manganese so levels are often already low in those who have an underactive thyroid. In cases of abnormal insulin levels, manganese absorption is impaired. With manganese deficiency, reproductive function in both men and women is compromised, ovarian and testicular degeneration may occur resulting in impaired ovulation and decreased sperm production. Infant mortality has been shown to increases with manganese deficiency.[2]

**Iron:** Low iron levels often confirmed by a low blood serum ferritin result, has been directly linked to infertility despite a normal haemoglobin level and no symptoms of anaemia.[4] Iron utilization is blocked by a number of heavy metals including lead and cadmium, high zinc levels, caffeine and phytates.[2] Low iron levels have been directly linked to low thyroid function and altered thyroid hormone levels may be linked to infertility and miscarriage. Women are generally low in iron due to menstruation and pregnancy. Iron deficiency in pregnancy has been linked to cardiovascular problems for the neonate later in life. The concept of using HTMA therefore reinstates hope to couples experiencing infertility. It also provides clinical insight and treatments to correct imbalances to ensure reproductive and neonatal health and wellbeing.

## Addressing Nutrient Imbalances and Toxic Accumulations

Treatment protocols to address nutritional imbalances and toxic accumulations often commence on two levels, chelation and supplementation. The use of HTMA analysis is invaluable to detect the levels of these toxic elements and heavy metals in the body. Chelation and supplementation of nutrients are prescribed according to the need for specific antagonistic and synergistic actions of minerals and heavy metals. For example, to decrease copper accumulation, we supplement with the antagonistic nutrients, Vitamin C, zinc and molybdenum.

**Chelation and Supplementation:** The mode of action of chelation primarily depends on the level of accumulated toxic elements, heavy metals and the rate at which the elements need to be removed from the body. Intravenous chelation for toxic elements such as lead and other heavy metals is offered by various medical practitioners specialising in nutritional and environmental medicine. These options are extremely effective but are invasive, costly and are not without potential side effects Intravenous nutrients can be administered to alleviate deficiency symptoms and rapidly increase nutrient levels.

Chelation can also be achieved by using nutrients, generally by prescribing those which are antagonistic to the problematic toxic elements. For example, Vitamin C is an effective chelator removing copper from the liver and brain reservoirs. Vitamins that may assist in reducing excessive copper accumulation are B1, B2, B6, Folic acid, inositol and choline. Minerals antagonistic to copper include zinc, manganese, iron, sulphur and molybdenum. Many research papers and clinical trials show that by correcting nutritional imbalances and reducing the toxic load, you can restore homoeostasis and alleviate conditions arising from such deficiencies.

**HTMA Case Study 1:**

**A 38 year old woman with no previous pregnancies has been trying to conceive for 24 months with no success. On appearance she had facial hair and acne, suggestive of a progesterone deficiency. Her periods are irregular often with extended cycles and menstruation is very light with no evidence of ovulation.**

HTMA revealed a slow metabolic type with adrenal stress (high Mg and Ca). Copper levels were 8.7 and Zn/Cu ratio was 2.64. Other concurrent deficiencies consistent with copper toxicity include poor iron absorption, deficiency in molybdenum and a high sodium/low potassium ratio.

***Treatment protocol:*** Vitamin C plus – 2 morning and night. Molyzinc - 1 morning and night, Aden Complex 1 in morning, Vitex Agnus Castus 2gm nightly. Eventually, the Vitex was exchanged for Bio-identical Hormone Replacement Progesterone Cream 3.2% administered in the second half of the cycle (by G.P.). High aluminium levels were treated with Algotene 2 bd and Malic acid (Apple cider vinegar).

Within 3 menstrual cycles, length and flow of period had normalised, acne and hair growth ceased. Minor mucous increases were evident mid-cycle. At 7 months after commencement of treatment pregnancy was confirmed.

**HTMA Case Study 2:**

**A 41 year old female with one previous full term birth (5 years prior) with a history of endometriosis and Polycystic Ovarian Syndrome (PCOS). Her periods were very infrequent and she was trying to conceive for 4 years with no success.**

HTMA revealed slow metabolic type with adrenal stress. Copper levels were extremely high at 11.1 and Zn/Cu ratio: 1.62. Cu/Mo ratio: 11100:1 (normal 625:1). Other significant ratio imbalances included: Fe/Hg: 7.5 and Se/Hg.

***Treatment protocol:*** Vitamin C plus, Selenium plus, Molyzinc, Parapack Vegan, Algotene and Shatavari 2gm daily and Vitex 2gm in second half of cycle (after cycle returned at 9 weeks).

Treatment continued for 2 months. Pregnancy was achieved but miscarried at 6 weeks. The client is currently continuing treatment, she feels healthier and is having regular cycles and is ovulating on Day 13.

The client continued with treatment for a further 11 months and successfully achieved another pregnancy. She is currently 27 weeks pregnant. All is normal with the pregnancy which was confirmed by amniocentesis.

*Tracey is an experienced Naturopath and Natural Medicine Practitioner, Registered Nurse and Midwife with more than 23 years of clinical practice specialising in Obstetrics, Reproductive and Women's Health. Tracey has had great success in assisting many couples to achieve successful pregnancy outcomes utilising natural therapies. Tracey can be contacted via email: whereeastmeetswest@bigpond.com.*

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