Hair Tissue Mineral Analysis

Patient	Mr Test Patient
DOB	28-Oct-1966
Address	324 Canning Hwy Bicton WA 6157
Practitoner	Mr John Smith
Collection date	08-Apr-2023
Report date	08-Apr-2023

Medi Scan

www.mediscan.net.au

Introduction

Hair Tissue Mineral Analysis (HTMA) is an analytical test that measures the mineral content of the hair. As a simple, non-invasive test, HTMA is able to provide you or your practitioner, with valuable information to review as part of your treatment program. Interpreted correctly, HTMA may provide indications of mineral imbalances, deficiencies, and excesses of many essential and toxic elements.

Hair is a keratinous structure protruding from the epidermis. It is primarily made up of dead, keratinised cells. Strands of hair develop through an opening in the dermis called the hair follicle. What we can see beyond the scalp is known as the “hair shaft”. The rest of the hair, which is anchored in the follicle, lies beneath the skin and is referred to as the “hair root”, which ends at the base of the hair bulb. Surrounding the hair bulb is the dermal papilla comprised of connective tissues with blood vessels and sensory endings from below it.

As hair grows, it locks in a record of our internal environment and when tested, accurately provides concentrations of minerals that have accumulated in the hair tissue over the hair growth period.

Minerals are essential for daily life and wellbeing. They are necessary and involved in many bodily needs such as structural support, cellular metabolism, nerve activity, immune functions, energy production and enzyme activity and many more. Therefore, many health conditions are aggravated by mineral imbalances and toxic heavy metal excess.

Ideally, one should get all mineral needs from a balanced diet. However, many factors can affect mineral nutrition such as environmental pollution and proximity, chemical food additives, dietary habits, genetic and metabolic disorders and diseases, medications and stressful lifestyles.

Now that you have accessed HTMA, it is critical to interpret the results correctly.

Before analysing the results, it is important to understand the strengths and limitations of any diagnostic test you use, including HTMA.

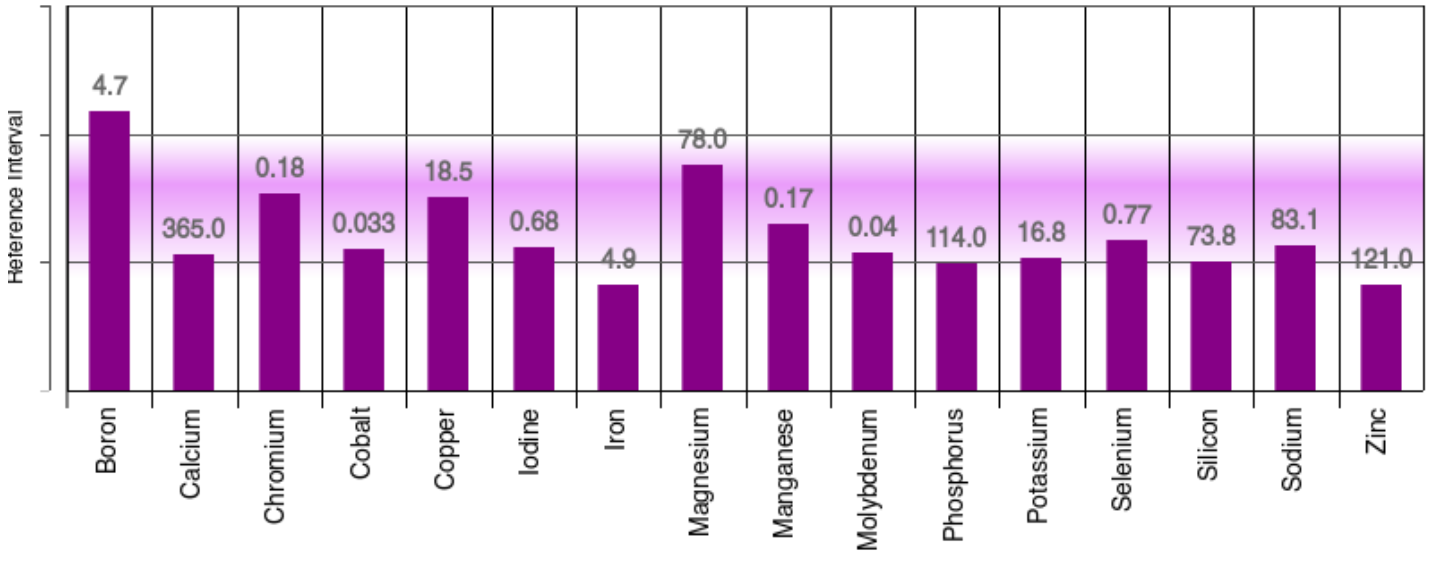
What HTMA will tell you:

- Deficiencies of certain trace minerals
- Excesses or imbalances or trace minerals
- Presence of heavy metal toxicity

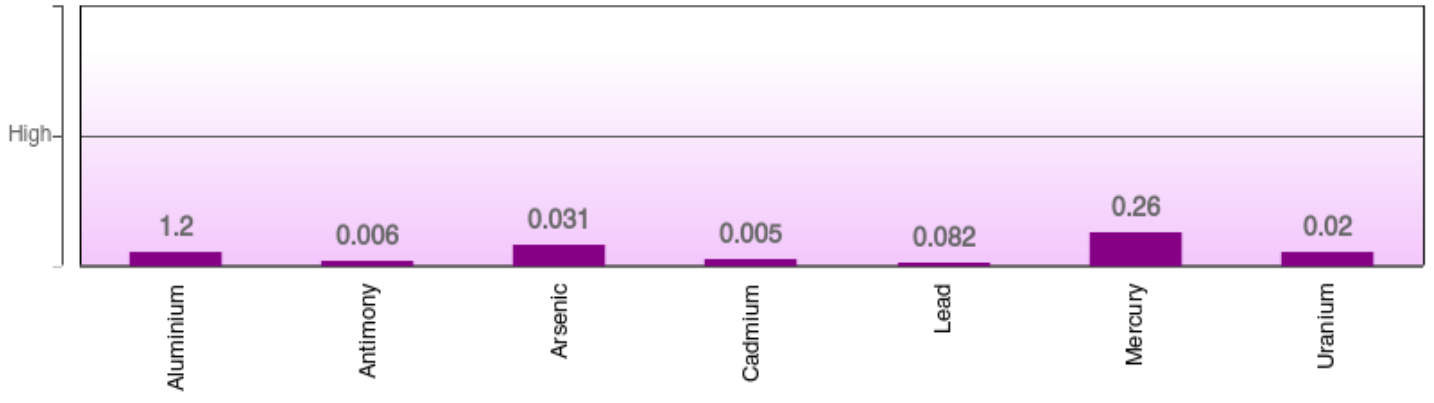
What HTMA will not tell you:

- In most cases, HTMA will not give a diagnosis other than for heavy metal poisoning
- The value of mineral ratios may be overestimated and should be used with caution
- Exogenous contamination from dust, water and hair treatments should always be considered if one mineral is especially high and out of context with other minerals

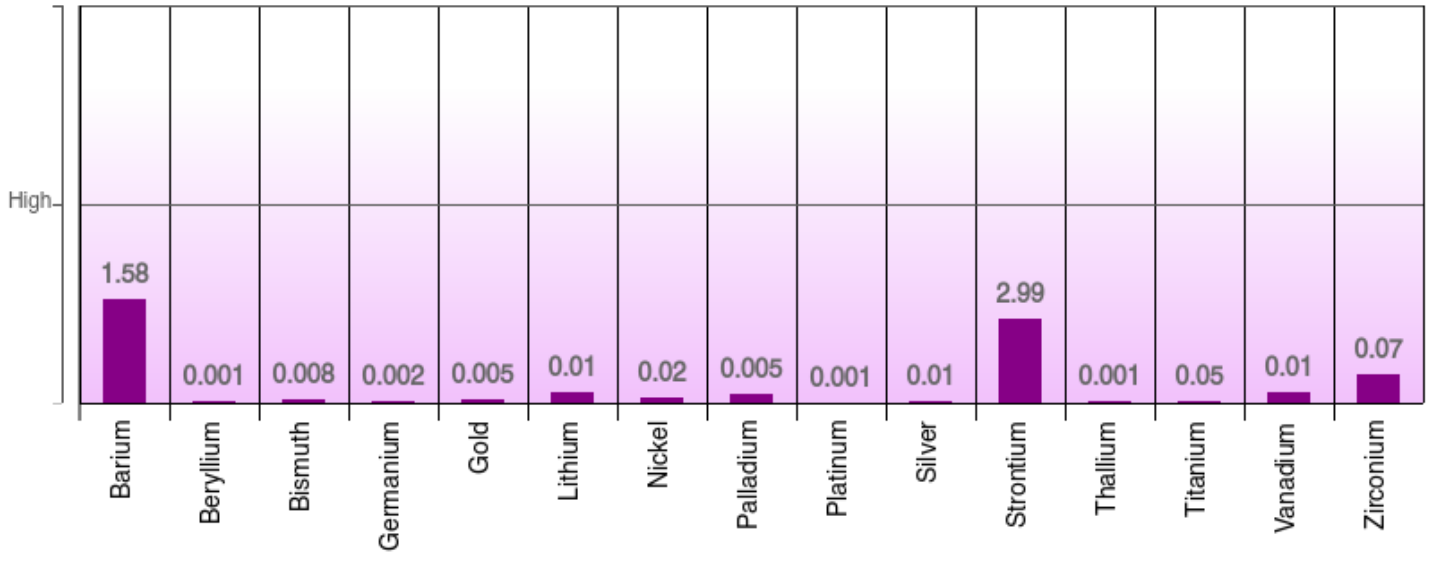
Minerals



Toxic Elements

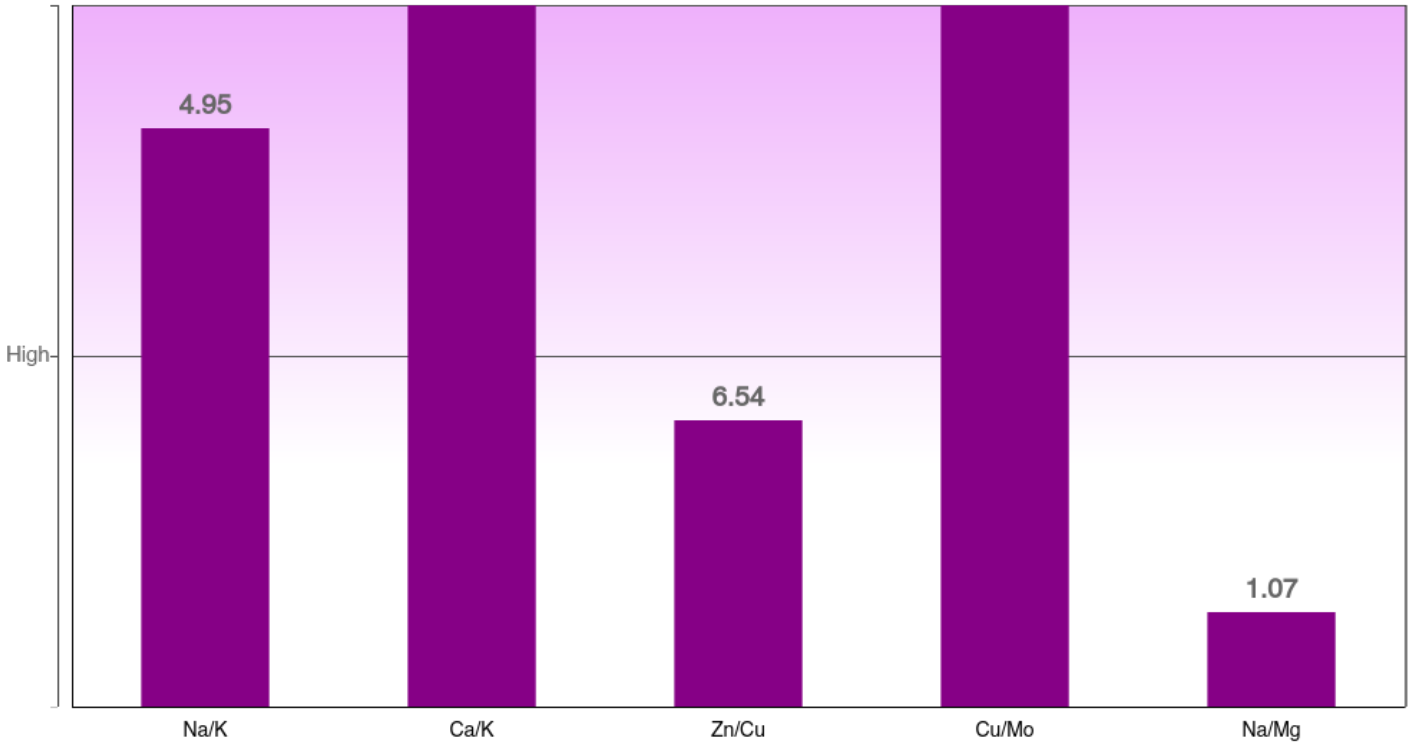


Other Elements

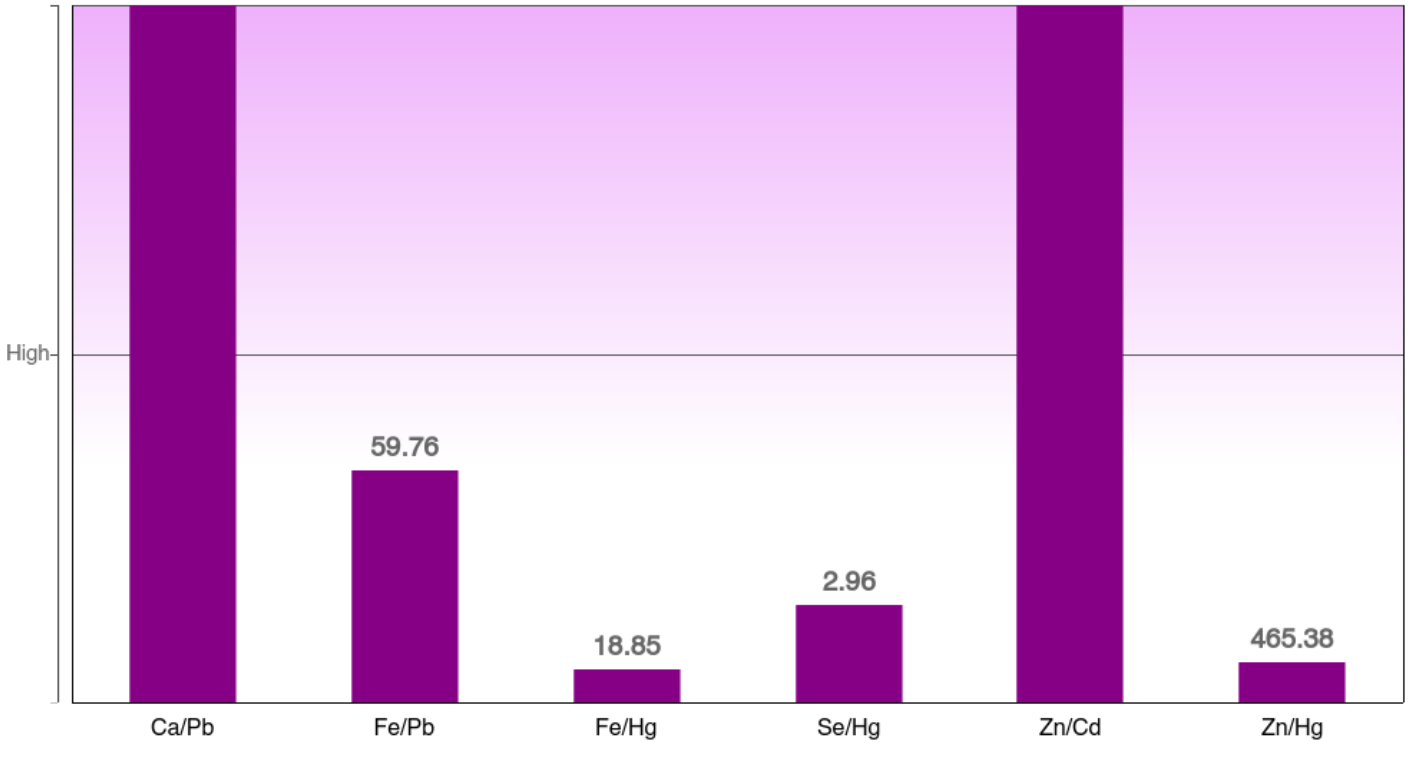


Any result < 0.001 ppm is not detectable and is almost zero

Significant Ratios



Toxic Ratios



Minerals

Minerals	Result	Reference Range PPM (mg/kg)
Boron	4.7	0.3 - 3.5
Calcium	365.0	300.0 - 1800.0
Chromium	0.18	0.04 - 0.3
Cobalt	0.033	0.002 - 0.3
Copper	18.5	10.0 - 27.0
Iodine	0.68	0.3 - 3.5
Iron	4.9	6.0 - 14.0
Magnesium	78.0	20.0 - 100.0
Manganese	0.17	0.07 - 0.4
Molybdenum	0.04	0.02 - 0.3
Phosphorus	114.0	115.0 - 180.0
Potassium	16.8	10.0 - 200.0
Selenium	0.77	0.6 - 1.6
Silicon	73.8	70.0 - 550.0
Sodium	83.1	20.0 - 500.0
Zinc	121.0	145.0 - 220.0

Toxic Elements

Element	Result	Reference Range PPM (mg/kg)
Aluminium	1.2	0.0 - 12.0
Antimony	0.006	0.0 - 0.2
Arsenic	0.031	0.0 - 0.2
Cadmium	0.005	0.0 - 0.12
Lead	0.082	0.0 - 3.3
Mercury	0.26	0.0 - 1.0
Uranium	< 0.02	0.0 - 0.2

Other Elements

Element	Result	Reference Range PPM (mg/kg)
Barium	1.58	0.0 - 3.0
Beryllium	< 0.001	0.0 - 0.1
Bismuth	0.008	0.0 - 0.5
Germanium	< 0.002	0.0 - 0.4
Gold	< 0.005	0.0 - 0.3
Lithium	0.01	0.0 - 0.2
Nickel	0.02	0.0 - 0.8
Palladium	< 0.005	0.0 - 0.12
Platinum	< 0.001	0.0 - 0.6
Silver	0.01	0.0 - 1.2
Strontium	2.99	0.0 - 7.0
Thallium	< 0.001	0.0 - 0.2
Titanium	< 0.05	0.0 - 10.0
Vanadium	0.01	0.0 - 0.2
Zirconium	0.07	0.0 - 0.5

Significant Ratios

Ratio	Result	Reference
Na/K	4.95	3.0
Ca/K	21.73	5.0
Zn/Cu	6.54	8.0
Cu/Mo	462.5	115.0
Na/Mg	1.07	4.0

Toxic Ratios

Ratio	Result	Reference
Ca/Pb	4451.22	1680.0
Fe/Pb	59.76	90.0
Fe/Hg	18.85	200.0
Se/Hg	2.96	10.6
Zn/Cd	24200.0	10000.0
Zn/Hg	465.38	4000.0

Results are expressed in parts per million (ppm)

Any result < 0.001 ppm is not detectable and is almost zero

Laboratory Analysis Provided by Source Certain

Understanding The Graphics

Nutritional Elements

In this segment of the report, an evaluation of the levels of different minerals in your body is presented. A comparison is drawn between your results and the typical range seen in the majority of individuals. If your results fall outside the normal range, it could suggest that your body might have difficulty sustaining sufficient levels of these essential minerals. Furthermore, the extent of deviation from the typical range may offer information regarding the magnitude of any possible issues.

Toxic Elements

The toxic elements section displays the levels of elements that could be detrimental to your health. It is optimal to maintain these levels as low as possible. In case your test outcomes indicate levels above the benchmark range, it might suggest the necessity of conducting additional inquiries before pursuing treatment to manage the possible health concerns associated with exposure to these elements.

Additional Elements

In this segment, the elements with insufficient research on their relevance to bodily functions or possible negative impacts are displayed. Additional investigations are required to gain a comprehensive understanding of their roles and connection the body. The data provided here can be utilized as supplementary research material for healthcare professionals to consider when evaluating an individual's overall health condition.

Significant Ratios

This section highlights the correlation between significant minerals by presenting their respective ratios. It is important to sustain an appropriate balance of minerals in the body as they function collaboratively. The ratios exhibited offer valuable information regarding how effectively the minerals operate in harmony with one another, thus maintaining balance within the body.

Toxic Ratios

This section demonstrates the correlation between crucial nutritional components and harmful metals. It is recommended that the ratio outcomes for each toxic metal be within the darker region of the graph, with higher values being more desirable. Ratios that fall within the lighter region may indicate that the harmful metal is obstructing the absorption of the essential nutritional element.

Nutrient Mineral Ratios

The next segment will concentrate on ratios of nutritional minerals that significantly differ from the typical range.

Continuous research implies that metabolic malfunction frequently emerges, not from the scarcity or excess of a specific mineral, but rather from an atypical balance or ratio of minerals. Given the intricate interdependence among minerals, it is critical to detect any imbalances. After identifying these imbalances, corrective therapy can be employed to reinstate a more standard biochemical equilibrium.

High Sodium/Magnesium (Na/Mg) Ratio

The sodium-to-magnesium ratio is higher than the typical range, indicating an augmented requirement for cellular magnesium, which can be influenced by diverse factors. One potential explanation is that excessive consumption of dietary sodium can decrease the body's capacity to absorb magnesium. Insufficient magnesium intake or reduced magnesium retention in the body could be another contributing factor. Irrespective of the root cause, it is advisable to prioritize foods with high magnesium content and avoid factors that could lead to additional magnesium loss, such as protein drinks.

High Calcium/Magnesium(Ca/Mg) Ratio

Maintaining an appropriate equilibrium between calcium and magnesium is vital for achieving optimal health. When this balance is disturbed, one mineral becomes more dominant than the other. In this situation, calcium levels surpass magnesium levels, as indicated by a high Ca/Mg ratio, which may signify abnormal calcium metabolism. This trend accentuates the suppressing impact on magnesium's function within the body, underscoring the necessity for greater consumption of dietary magnesium.

Mineral Metabolism and Vitamin B6

Inadequate intake or elevated demand for vitamin B6 can lead to imbalances in the metabolism, utilization, and equilibrium between calcium and magnesium. Without vitamin B6, calcium retention is increased, while magnesium removal is elevated. Therefore, the present HTMA pattern in this patient might imply a heightened necessity for vitamin B6. Only take Vitamin B6 if recommended by your practitioner.

Toxic Metal Levels

Heavy metals have a significant impact on the onset of several illnesses, including developmental and neurological disorders in children, and in adults, diseases such as hypertension, neurological disease, cancer and heart disease.

The Hair Tissue Mineral Analysis (HTMA) is a reliable and efficient screening technique for detecting heavy metals. Hair is a preferred medium for this purpose because it can accumulate toxic metals up to 10 times more than blood. The reason for this is that keratin, the primary component of hair, contains a high amount of cysteine residues that attract heavy metals. As blood circulates during the active growth phase, the elements bind with keratin in the hair follicle, leading to their accumulation in the hair tissue.

Hair Tissue Mineral Analysis (HTMA) offers a detailed record of a person's exposure to heavy metals over the last 3 to 6 months. In addition, it can identify any concurrent mineral imbalances during the evaluation of heavy metal toxicity, providing a more comprehensive understanding for an effective therapeutic approach.

Toxic Metal Ratios

This section of the report will focus on toxic metal ratios that significantly deviate from ideal and acceptable ranges.

Toxic metals can be found in varying amounts in everyone's body, but their retention depends on individual susceptibility, which can be affected by the balance of protective nutrient minerals relative to heavy metals. For example, lead accumulation can have a more damaging effect on body chemistry when calcium and iron levels are inadequate. Analyzing the levels of toxic metals along with protective minerals can often help determine the extent to which heavy metals can lead to altered body chemistry.

Selenium/Mercury (Se/Hg) Ratio

Mercury, a toxic metal, can cause increased oxidative damage in cells. Selenium, however, is known to protect tissues from this damage by binding with mercury and reducing its harmful effects. A low ratio of selenium-to-mercury may indicate an increased production of free radicals.

Zinc/Mercury (Zn/Hg) Ratio

When the ratio of zinc to mercury (Zn/Hg) is low, it suggests that the protective effect of zinc against the harmful effects of mercury is weakened. Zinc plays an important role in protecting the body against mercury toxicity. Thus, maintaining adequate levels of zinc in the body is essential to prevent mercury-related health issues. Although the current level of mercury may be within acceptable limits, a persistent trend of a low Zn/Hg ratio can lead to minor symptoms or adverse reactions associated with mercury exposure.

Element antagonism

The interplay between certain elements can lead to a scenario where one element decreases while another increases in tissue concentration or vice versa. It is crucial to recognize this relationship to make the best use of Hair Tissue Mineral Analysis (HTMA).

Comments

Results suggest possible malabsorption and that one should consider Healthcare Practitioner advice to exclude causes such as Helicobacter pylori, Coeliac Disease, medications that reduce stomach acid, SIBO and parasites such as Blastocystis, Giardia and Dientamoeba.

Check your hair dye for lead. If not caused by hair dyes check blood levels.

Consider doing blood tests to exclude iron deficiency, as your tissue levels of iron are low. This may be due to poor dietary iron intake, blood loss or malabsorption possibly from Helicobacter pylori, Coeliac Disease, medications that reduce stomach acid, SIBO and parasites such as Blastocystis, Giardia and Dientamoeba. Supplementation should be on the advice of your Healthcare Practitioner.

The hair tissue mineral analysis has revealed excess in the following toxic elements:

- **Aluminium**
- **Antimony**
- **Arsenic**
- **Lead**
- **Mercury**
- **Uranium**

With appropriate treatment, it is likely that you have been exposed to the following toxic elements and it may appear in following hair tissue mineral analyses:

- **Cadmium**
- **Aluminium**

It is advisable to reduce /remove exposure to any listed toxic elements (refer to attached information on likely past and/or current sources).

Iron

If the iron level is low, some of the deficiency conditions include:

- Anaemia
- Angular cheilitis
- Brittle hair
- Chronic mucocutaneous candidiasis
- Cravings for ice (pagophagia)
- Cravings for nonfood material such as dirt (pica)
- Difficulty maintaining body temperature in a cold environment
- Glossitis
- If low in pregnancy, increases the risk of the infant of low birthweight, premature birth, low iron stores, and impaired cognitive and behavioural development
- Adverse cognitive and psychological effects in infancy, including delayed attention and social withdrawal
- Impaired cognitive function
- Impaired exercise or work performance
- Impaired immune function
- Learning difficulties in infants and children
- Oesophageal webs
- Restless legs
- Spoon shaped fingernails

Zinc

If the zinc level is low, some of the deficiency conditions include:

- Acne
- ADHD
- Age-related macular degeneration
- Allergy
- Delayed healing of wounds
- Delayed sexual maturation
- Depression
- Dermatitis
- Diarrhea
- Fertility issues for men and women
- Glossitis
- Growth retardation
- Hair loss
- Hypogonadism in males
- Hypopigmentation of hair
- Impaired glycaemic control
- Impaired immune function
- Impotence
- Insomnia
- Loss of appetite
- Loss of smell
- Mental lethargy
- Nail changes such as white spots
- Prostate disease
- Reduced testosterone
- Stomatitis
- Suboptimal pregnancy outcomes
- Taste abnormalities
- Weight loss

Please refer to Mediscan website for the references used for the sources of toxic elements and for the conditions associated with the deficiencies of the minerals

Products

Compounded Vitamin/Mineral/Amino Acid: twice daily

Selenium 50mcg (as Picolinate)
Silica 30mg
Zinc 12.5mg (as Picolinate)
N-Acetyl Cysteine 250mg

Vitamin C 1000mg ONCE daily

Vitamin E 400-500IU (avoid if on blood thinning medication) ONCE daily

Disclaimer

Source Certain takes all relevant measures to ensure quality of the analytical processes completed and takes no responsibility for the processes undertaken by the client in collection, transportation of the samples and maintenance of continuity and integrity through these processes. Values reported relate only to the sample received and tested and unless otherwise stated, all quality control samples performed within specifications established by the Laboratory. Source Certain makes no claims as to the efficacy, consumer safety or other intended use or application of the submitted specimen.

This report shall not be reproduced except in full, without the written approval of both Source Certain and Mediscan, and should not be used for advertisement or judicial purposes.

This report should not be considered as diagnostic, but rather as a screening tool that provides an additional source of information. This report should only be used in conjunction with other laboratory tests, history physical examination and the clinical expertise of the attending healthcare professional.

Graphs, ratios and comparisons with reference ranges are provided for convenience only and should not be considered an interpretation of results or a diagnosis. Any nutrients recommended are for adults only and not for children, pregnant or breastfeeding women. Please consult a healthcare practitioner before commencing any new medication or nutritional supplement. Follow up tests are recommended after 6-8 months.

Additional notes:

- Often there is an increase in the levels of toxic elements in the initial follow up hair analysis due to the body having the nutrient load required to start removing the toxins from the tissues. This will decrease as the levels in the tissue decrease. Depending on the level of exposure this can take anywhere from 6 months to a few years.