

Micro Trace Minerals Laboratory

environmental & clinical laboratory

Röhrenstrasse 20, 91217 Hersbruck, Germany
P.O.Box 4613; Boulder, CO 80306-4613, USA



MINERAL ANALYSIS

Childs' Hair

		Lab Number		1KH235799	
Doctor/Clinic	Synlab MVZ Leinfelden GmbH			Test Date	04.08.2020
Patient Name	970903490600 Albana Kemali	Sex	f	D.O.B.	13.11.2013
Clinical Information	As confirmed			Page	1/5

	Acceptable Range	Test Value		
Essential Trace Elements (ppm = mg/kg = mcg/g)				
Chromium (Cr)	0,020 --- 0,150	0,100		
Cobalt (Co)	< 0,150	0,035		
Copper (Cu)	6,700 --- 37,000	12,051		
Iodine (I)	0,150 --- 3,500	1,174		
Iron (Fe)	7,700 --- 15,000	17,534	↑	
Manganese (Mn)	0,070 --- 0,500	0,642	↑	
Molybdenum (Mo)	0,020 --- 1,000	0,032		
Selenium (Se)	0,400 --- 1,400	0,584		
Vanadium (V)	0,010 --- 0,150	0,050		
Zinc (Zn)	110,000 --- 227,000	229,223	↑	
Essential Macroelements (ppm = mg/kg = mcg/g)				
Calcium (Ca)	200,000 --- 850,000	1.015,603	↑	
Magnesium (Mg)	20,000 --- 115,000	315,236	↑	
Nonessential Trace Elements (ppm = mg/kg = mcg/g)				
Boron (B)	< 2,000	0,932		
Germanium (Ge)	< 0,500	0,011		
Lithium (Li)	< 0,200	0,018		
Strontium (Sr)	0,110 --- 4,280	3,481		
Tungsten (W)	< 0,020	0,002		
Potentially Toxic Elements (ppm = mg/kg = mcg/g)				
Aluminum (Al)	< 8,000	11,282	↑	
Antimony (Sb)	< 0,200	0,028		

n.n. = not detected, < x = below Detection Limit

Quality control: Dipl. Ing. Friedle, Accreditation: DIN EN ISO 17025; Validation: Dr. E. Blaurock-Busch PhD

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Acceptable Range

Test Value

Potentially Toxic Elements (ppm = mg/kg = mcg/g)

Arsenic-total (As)	< 0,200	4,923		
Barium (Ba)	< 2,650	0,521		
Beryllium (Be)	< 0,030	< 0,010		
Bismuth (Bi)	< 0,179	0,173		
Cadmium (Cd)	< 0,200	0,039		
Lead (Pb)	< 3,000	0,644		
Mercury (Hg)	< 0,300	0,157		
Nickel (Ni)	< 0,850	0,193		
Palladium (Pd)	< 0,100	< 0,050		
Platinum (Pt)	< 0,070	< 0,005		
Silver (Ag)	< 1,000	0,052		
Thallium (Tl)	< 0,010	< 0,001		
Tin (Sn)	< 0,930	0,424		
Titanium (Ti)	< 0,650	0,332		
Uranium (U)	< 0,100	0,020		
Zirconium (Zr)	< 1,470	0,548		

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This Analysis Determined The Following Mineral Deficiencies And Excesses. Since it is difficult to distinguish treated samples from untreated ones, it is assumed that the spectroanalytical analysis was performed on chemically untreated hair as requested in our laboratory brochure. Chemically treated hair does not provide reliable results and MTM does not assume responsibility for data obtained from treated hair. The information contained in this elemental analysis report is designed as an interpretive adjunct to normally conducted diagnostic procedures. The data and information provided here is based on information related to the health of children. The findings are best viewed in the context of a medical examination and history.

ALUMINUM (Al):

Aluminum is commonly ingested with food, medicine and water.

COMMON SOURCES: Soft drinks, medications, and certain treated waters. Al is also used in certain covering called Waraq which is another source of silver in India as well as Ayurvedic medicines. Aluminum cooking vessels may also be a cause of excessive Al-intake. For decades, aluminum was considered virtually non-absorbable and was thus freely used in a variety of food additives and over-the-counter drugs such as antacids. New research suggests that Al can cause neurological changes as seen in Alzheimer's and Parkinson's disease, and dialysis dementia. Al can bind to DNA, resulting in abnormal neurofibrillary tangles in the brain. Al inhibits the enzyme, hexokinase. It is absorbed in the intestine and excreted via the kidney. Al can be deposited in bones, particularly in the presence of calcium deficiency.

TOXICITY SYMPTOMS: Include muscular coordination problems, colic and gastric irritation.

THERAPEUTIC CONSIDERATION: Increased blood levels indicate increased exposure and uptake. To decrease uptake and increase elimination, support digestive and kidney function and check calcium balance. Check hair tissue levels to confirm or rule out long-term exposure. Chelation treatments support the binding and elimination of Aluminum. Comparing pre and post urine levels is a direct reflection on the chelating agents binding capacity and the body's ability to detoxify.

ARSENIC (As):

All the biochemical actions of arsenic are attributed to its trivalent forms, widely found in polluted environments. Inorganic arsenic, or arsenite, does accumulate in tissues and ranks second among heavy metals causing death. Arsenite rapidly leaves the blood to be deposited in vital organs and tissues such as hair, skin and nails.

TOXICITY SYMPTOMS have been associated with hair loss, confusion, constipation, delayed wound healing, dermatitis, diarrhea, drowsiness, edema, fatigue, muscle pains, numbness, seizures, and weakness. Chronic arsenic exposure is known to cause anemias, bone marrow depression, cancers of the respiratory tract, skin and neurological problems. Long-term exposure to small amounts of arsenic increase hair and urine levels; however considerate chronic exposure results in hair loss. Hair or nails are known to be used in forensic medicine to establish long-term, chronic exposure and slow-rate poisoning.

SOURCE: Smelters, industrial pollution, arsenic-containing paint, polluted water and fish.

BLOOD LEVELS are not known to increase until toxicity has been reached. Urine measurements are used to monitor chelation therapy.

THERAPEUTIC CONSIDERATION: Cases of chronic exposure respond well to antioxidant therapy, especially ascorbic acid, calcium ascorbate, all tocopherols (vitamin E) and an increased intake of sulfur-containing amino acids and vitamin B6.

Arsenic suppresses iodine and selenium. In severe cases, DMPS chelation is recommended.

CALCIUM (Ca):

High tissue levels of chemically untreated hair reflect malabsorption problems and a masked deficiency, which is caused by calcium being drawn from bones and redistributed into other tissues such as hair. Thus, high hair levels reflect bone withdrawal and osteoporotic tendency. Calcium deficiency symptoms such as unhealthy hair, nail and teeth, muscle cramping at night, insomnia, menstrual problems, nervousness and irritability may be present. When such deficiency symptoms are present, moderate calcium supplementation is recommended in combination with a low fat diet and increased activity level. To further support the calcium absorption and to normalize tissue levels, digestive aids and an increased intake of lecithin are recommended.

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IRON (Fe):

Iron is regulated primarily by absorption rather than by excretion. In fact, the body has no effective means of excreting excesses of iron, other than bleeding and thus iron accumulation is possible. High hair levels suggest elevated tissue storage and the body's inability to mobilize iron long before serious toxicity symptoms appear. Signs and symptoms of a tendency towards iron overload are related to the involved organ systems, esp. the liver. About one-third of body iron is stored in the liver, one third in the bone marrow and the remainder in the spleen and other tissue. Excess iron storage carries the risk of hemochromatosis, liver problems, diabetes, and heart disease. Frequent blood transfusion can lead to excess iron storage. A high dietary iron intake can cause copper and zinc deficiencies, resulting in anemia, bone and joint disorders, color and taste acuity, and increased susceptibility to infectious disease. Symptoms of iron overload may include anorexia, dizziness, fatigue, and headaches. Causes of an excess iron load may be iron-rich drinking water, frequent cooking of acidic food in iron cookware, excessive iron supplementation, and repeated blood transfusion.

FOODS RICH IN IRON ARE: Liver and other organ meats, beef, dried fruits, lima beans, ham, legumes, and oysters.

THERAPEUTIC CONSIDERATION: Support liver functions by supplying sufficient amino acids and B-vitamins. Hyperactive and food sensitive children are prone to high iron levels in hair tissue.

MAGNESIUM (Mg):

Magnesium is an essential element with both electrolyte and enzyme-activator functions. It is important for energy function and supports the carbohydrate, fat and protein metabolism. High hair tissue levels reflect early bone withdrawal and maldistribution into tissue such as hair. In most cases, high hair levels are signs of a masked deficiency and can be confirmed with deficiency symptoms such as weakness, confusion, personality changes, muscle tremor and spastic tendencies during mild exercise, bizarre muscle movements, especially in the face, swollen gums, skin lesions, lack of coordination and digestive disorders. A magnesium-deficient diet produces hyperkinetic behavior and increases convulsion tendencies, especially in combination with an inadequate B-Vitamin-intake.

RICH FOOD SOURCES OF MAGNESIUM ARE: All fruit and dark green vegetables, nuts, legumes, wholegrain cereals and breads.

THERAPEUTIC CONSIDERATION: B-Vitamins aid magnesium absorption.

MANGANESE (Mn):

High tissue levels suggest long-term overexposure due to industrial pollution or high water content. Well water can be rich in manganese, contributing to bacterial growth in water. Plants grown in industrially polluted soil and water can contribute to excess intake, which interferes with the iron metabolism and impairs the vitamin B1 metabolism. Toxicity symptoms are central nervous system disorders, neurological and behavioral disorders, depressed appetite, and gait problems.

THERAPEUTIC RECOMMENDATIONS: Low calcium levels increase manganese uptake. High manganese increases the demand for vitamin C and copper.

ZINC (Zn):

Occasionally high hair zinc levels are due to long-term use of zinc-containing shampoos, cremes such as zinc oxide applied to the scalp and other zinc-rich medical lotions. While our laboratory cautiously and meticulously washes hair before testing with deionized solutions to free it from external contaminants, it is possible that brittle hair absorbs certain elements, causing elevated hair levels. Another possible cause of high hair levels important may be long-term supplementation of nutritional zinc or exposure to zinc dust (as it may be released by certain industries). High hair zinc levels are also found in the presence of a disturbed hair growth pattern as is seen in people suffering from hair loss problems. When hair loss is severe, these high hair zinc levels reflect a masked deficiency that is best treated with the supplementation of amino acids, the B-complex vitamins and some zinc. Since zinc uptake can be competitive with that of iron and copper, it is important to evaluate iron and copper tissue levels. When iron and copper levels are low in the presence of high hair zinc levels, a multimineral combined with a B-vitamin may be recommended instead of zinc supplementation.

THERAPEUTIC CONSIDERATION: Symptoms of zinc overload are similar to zinc deficiency symptoms, causing immune dysfunction and slow wound healing. B-vitamins support the zinc metabolism and utilization.

The following nutritional program is suitable for children 2 to 12 years of age. For a child under 2 years of age the following recommended dosage have to be adjusted, depending on the child's health, weight and condition. The outlined nutritional support program is recommended for 3-4 months, after which a repeat analysis is recommended. A follow-up test would evaluate and determine this child's ability to digest and absorb nutrients. This program has should be supervised by a licensed health care provider. If any questions or problems arise, consult your doctor.

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Aluminum (Al)

To reduce the aluminum uptake, support digestive function. Increase fiber intake and support intestinal function. Probiotics such as Lactobacillus acidophilus improve intestinal pH and flora, which in turn reduces the aluminum uptake. Avoid colas and soft drinks.

Calcium (Ca)

To improve calcium utilization, reduce consumption of dairy products. Avoid fatty foods and increase intake of fiber. Support digestive function. Physical activity greatly aids calcium utilization. Check magnesium and vitamin D intake as they improve calcium utilization.

Iron (Fe)

To reduce tissue iron levels, support liver function. Avoid iron-rich foods such as meat and reduce consumption of fatty foods especially those of animal fat. Digestive enzymes, B-vitamins and lecithin intake support liver function. Cooking in cast iron pots can increase the iron content thirty-fold. High iron levels increase the need for antioxidants such as vitamin C and E. When zinc, copper and/or manganese levels are low, iron absorption is High. Thus, high iron storage can be prevented by normalizing the overall mineral balance. If zinc is low or borderline low, age-appropriate zinc supplementation can reduce iron absorption and normalize tissue levels.

Magnesium (Mg)

High hair magnesium levels may indicate a masked deficiency and an increased need for magnesium. Check for magnesium deficiency symptoms. The minimum daily requirements are: 50mg for children up to 6months; 70mg for 6-12months of age; 150mg for children 1-3years of age; 200mg for age 4-6years; 250mg for age 7-10years and 350mg for youngsters 11-14years of age.

Manganese (Mn)

To normalize manganese tissue levels, increase intake of free amino acid complex, 1/day. Increase plant protein intake. Avoid black tea and herbal teas.

Zinc (Zn)

High hair zinc levels are often found in the presence of hair loss problems or when hair growth patterns are disturbed. High hair zinc levels may also be due do prolonged zinc therapy or frequent use of zinc oxide lotion or creams on scalp. Thus, high hair zinc levels generally reflect a masked deficiency, which can be further substantiated by the presence of zinc deficiency symptoms such as slow wound healing, sugar intolerance, skin inflammation, lethargy and a loss of taste and smell. However, high hair zinc levels may also be due do prolonged zinc therapy. A blood test be required. Ask your physician.