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Iron

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Description

Iron is a mineral that the human body uses to produce the red blood cells (hemoglobin) that carry oxygen throughout the body. It is also stored in myoglobin, an oxygen-carrying protein in the muscles that fuels cell growth.

General use

Iron is abundant in red meats, vegetables, and other foods, and a well-balanced diet can usually provide an adequate supply of the mineral. But when there is insufficient iron from dietary sources, or as a result of blood loss in the body, the amount of hemoglobin in the bloodstream is reduced and oxygen cannot be efficiently transported to tissues and organs throughout the body. The resulting condition is known as iron-deficiency anemia, and is characterized by fatigue, shortness of breath, pale skin, concentration problems, dizziness, a weakened immune system, and energy loss.

Iron-deficiency anemia can be caused by a number of factors, including poor diet, heavy menstrual cycles, pregnancy, kidney disease, burns, and gastrointestinal disorders. Individuals with iron-deficiency anemia should always undergo a thorough evaluation by a physician to determine the cause.

Children two years old and under also need adequate iron in their diets to promote proper mental and physical development. Children under two who are not breastfeeding should eat iron-fortified formulas and cereals. Women who breastfeed need at least 15 mg of dietary or supplementary iron a day in order to pass along adequate amounts of the mineral to their child in breast milk. Parents should consult a pediatrician or other healthcare professional for guidance on iron supplementation in children.

It has been theorized that excess stored iron can lead to atherosclerosis and ischemic heart disease. Phlebotomy, or blood removal, has been used to reduce stored iron in patients with iron overload with some success. Iron chelation with drugs such as desferrioxamine (Desferal) that help patients excrete excess stores of iron can be helpful in treating iron overload caused by multiple blood transfusions.

Iron levels in the body are measured by both hemoglobin and serum ferritin blood tests.

Normal total hemoglobin levels are:

- neonates: 17-22 g/dl
- one week: 15-20 g/dl
- one month: 11-15 g/dl
- children: 11-13 g/dl
- adult males: 14-18 g/dl (12.4-14.9 g/dl after age 50)
- adult females: 12-16 g/dl (11.7-13.8 g/dl after menopause)

Normal serum ferritin levels are:

- neonates: 25-200 ng/ml
- one month: 200-600 ng/ml
- two to five months: 50-200 ng/ml
- six months to 15 years: 7-140 ng/ml
- adult males: 20-300 ng/ml
- adult females: 20-120 ng/ml

Preparations

Iron can be found in a number of dietary sources, including:

- pumpkin seeds
- dried fruits (apricots)
- lean meats (beef and liver)
- fortified cereals
- turkey (dark meat)
- green vegetables (spinach, kale, and broccoli)
- beans, peas, and lentils
- enriched and whole grain breads
- molasses
- sea vegetables (blue-green algae and kelp)

Eating iron-rich foods in conjunction with foods rich in vitamin C (such as citrus fruits) and lactic acid (sauerkraut and yogurt) can increase absorption of dietary iron. Cooking food in cast-iron pots can also add to their iron content.

The recommended dietary allowances (RDA) of iron as outlined by the United States Department of Agriculture (USDA) are as follows:

- children 0-3: 6-10 mg/day
- children 4-10: 10 mg/day
- adolescent and adult males: 10 mg/day
- adolescent and adult females: 10-15 mg/day
- pregnant females: 30 mg/day
- breastfeeding females: 15 mg/day

A number of herbal remedies contain iron, and can be useful as a natural supplement. The juice of the herb stinging nettle (*Urtica dioica*) is rich in both iron and vitamin C (which is thought to promote the absorption of iron). It can be taken daily as a dietary supplement. Dandelion (*Taraxacum officinale*), curled dock (*Rumex crispus*), and parsley (*Petroselinum crispum*) also have high iron content, and can be prepared in tea or syrup form.

In Chinese medicine, dang gui (dong quai), or *Angelica sinensis*, the root of the angelica plant, is said to both stimulate the circulatory system and aid the digestive system. It can be administered as a decoction or tincture, and should be taken in conjunction with an iron-rich diet. Other Chinese remedies include foxglove root (*Rehmannia glutinosa*), Korean ginseng (*Panax ginseng*), and astragalus (*Astragalus membranaceus*).

Ferrum phosphoricum (iron phosphate), is used in homeopathic medicine to treat anemia. The remedy is produced by mixing iron sulfate, phosphate, and sodium acetate, which is administered in a highly diluted form to the patient. Other homeopathic remedies for anemia include *Natrum muriaticum*, *Chinchona officinalis*, *Cyclamen europaeum*, *Ferrum metallicum*, and *Manganum aceticum*. As with all homeopathic remedies, the type of remedy prescribed for iron deficiency depends on the individual's overall symptom picture, mood, and temperament. Patients should speak with their homeopathic professional or physician, or healthcare professional before taking any of these remedies.

Iron is also available in a number of over-the-counter supplements (i.e., ferrous fumarate, ferrous sulfate, ferrous gluconate, iron dextran). Both heme iron and non-heme iron supplements are available. Heme iron is more efficiently absorbed by the body, but non-heme iron can also be effective if used in conjunction with vitamin C and other dietary sources of heme iron. Some multivitamins also contain supplementary iron. Ingesting excessive iron can be toxic, and may have long-term negative effects. For this reason, iron supplements should only be taken under the recommendation and supervision of a doctor.

Precautions

Iron deficiency can be a sign of a more serious problem, such as internal bleeding. Anyone suffering from iron-deficiency anemia should always undergo a thorough evaluation by a healthcare professional to determine the cause.

Iron overdose in children can be fatal, and is a leading cause of poisoning in children. Children should never take supplements intended for adults, and should only receive iron supplementation under the guidance of a physician.

Individuals with chronic or acute health conditions, including kidney infection, alcoholism, liver disease, rheumatoid arthritis, asthma, heart disease, colitis, and stomach ulcer should consult a physician before taking herbal or pharmaceutical iron supplements.

If individuals taking homeopathic dilutions of *Ferrum phosphoricum* experience worsening of their symptoms (known as a homeopathic aggravation), they should stop taking the remedy and contact their healthcare professional. A homeopathic aggravation can be an early indication that a remedy is working properly, but it can also be a sign that a different remedy is needed.

Patients diagnosed with hemochromatosis, a genetic condition in which the body absorbs too much iron and stores the excess in organs and tissues, should never take iron supplements.

Side effects

Taking herbal or pharmaceutical iron supplements on an empty stomach may cause nausea. Iron supplementation may cause hard, dark stools, and individuals who take iron frequently experience constipation. Patients who experience dark bowel movements accompanied by stomach pains should check with their doctor, as this can also indicate bleeding in the digestive tract.

Other reported side effects include stomach cramps and chest pain. These symptoms should be evaluated by a physician if they occur.

Some iron supplements, particularly those taken in liquid form, may stain the teeth. Taking these through a straw, or with a dropper placed towards the back of the throat, may be helpful in preventing staining. Toothpaste containing baking soda and/or hydrogen peroxide can be useful in removing iron stains from teeth.

Signs of iron overdose include severe vomiting, racing heart, bloody diarrhea, stomach cramps, bluish lips and fingernails, pale skin, and weakness. If overdose is suspected, the patient should contact poison control and/or seek emergency medical attention immediately.

Interactions

Iron supplements may react with certain medications, including antacids, acetohydroxamic (Lithostat), Dimercaprol, Etidronate, Fluoroquinolones. In addition, they can decrease the effectiveness of certain tetracyclines (antibiotics). Individuals taking these or any other medications should consult their healthcare professional before starting iron supplements.

Certain foods decrease the absorption of iron, including some soy-based foods, foods with large concentrations of calcium, and beverages containing caffeine and tannin (a substance found in black tea). These should not be taken within two hours of using an iron supplement. Some herbs also contain tannic acid, and should be avoided during treatment with iron supplements. These include allspice (*Pimenta dioica*) and bayberry (*Myrica cerifera*, also called wax myrtle).

Individuals considering treatment with homeopathic remedies should also consult their healthcare professional about possible interactions with certain foods, beverages, prescription medications, aromatic compounds, and other environmental elements-factors known in homeopathy as remedy antidotes-that could counteract the efficacy of treatment for iron deficiency.

Key Terms

Chelation

The use of a medication or herbal substances to inactivate toxic substances in the body. Chelation is used to treat iron overload in some patients.

Decoction

An herbal extract produced by mixing an herb in cold water, bringing the mixture to a boil, and letting it simmer to evaporate the excess water. The decoction is then strained and consumed hot or cold. Decoctions are usually chosen over infusion when the botanical in question is a root or berry.

Ferritin

An iron storage protein found in the blood. High levels of serum ferritin may indicate iron overload.

Hemochromatosis

Also known as iron overload; a genetic condition in which excess iron is stored in the tissues and organs by the body where it can build up to toxic amounts.

Homeopathic remedy

Used to treat illnesses that manifest symptoms similar to those that the remedy itself causes, but administered in extremely diluted doses to prevent any toxic effects.

Infusion

An herbal preparation made by mixing boiling water with an herb, letting the brew steep for 10 minutes, and then straining the herb out of the mixture. Tea is made through infusion.

Thalassemia

A group of several genetic blood diseases characterized by absent or decreased production of normal hemoglobin. Individuals who have thalassemia have to undergo frequent blood transfusions, and are at risk for iron overload.

Tincture

A liquid extract of an herb prepared by steeping the herb in an alcohol and water mixture.