

EFFECT OF IRON AND COPPER ELEMENTS ON PHYSIOLOGICAL PROCESSES IN THE BODY

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Annotatsiya: Ushbu maqolada temir va mis elementlarining inson organizmida qanchalik muhim o'rin egallashi va ular yetishmovchiligi natijasida kelib chiqadigan ko'plab xavfli kasalliklar haqida so'z boradi.

Kalit so'zlar: mikroelementlar, makroelementlar, temir, mis, gemoglobin, mioglobin, anemiya, kollagen.

Abstract: This article talks about how important iron and copper elements are in the human body and many dangerous diseases caused by their deficiency.

Key words: micronutrients, macronutrients, iron, copper, hemoglobin, myoglobin, anemia, collagen.

Metabolism, nutrition, breathing, blood circulation, excretion, internal secretion glands, nervous system activity and other tasks that provide the body are physiological processes in the body. The normal course of these physiological processes depends on macro and micronutrients in the body. Their lack in nutrients causes metabolic disorders and several disease.

Macronutrients are elements found in large quantities in the human body. Iron element is one such macronutrients. Iron is a mineral that the body needs for growth and development. Your body uses iron to make hemoglobin, a protein in red blood cells that carries oxygen from the lungs to all parts of the body, and myoglobin, a protein that provides oxygen to muscles.

Iron is found naturally in many foods and is added to some fortified food products. You can get recommended amounts of iron by eating a variety of foods, including the following:

- Lean meat, seafood, and poultry
- Iron-fortified breakfast cereals and breads
- White beans, lentils, spinach, kidney beans, and peas
- Nuts and some dried fruits, such as raisins

Iron in food comes in two forms: heme iron and nonheme iron. Nonheme iron is found in plant foods and iron-fortified food products. Meat, seafood, and poultry have both heme and nonheme iron. Your body absorbs iron from plant sources better when you eat it with meat, poultry, seafood, and foods that contain vitamin C, such as citrus fruits, strawberries, sweet peppers, tomatoes, and broccoli.

In the short term, getting too little iron does not cause obvious symptoms. The body uses its stored iron in the muscles, liver, spleen, and bone marrow. However, when levels of iron stored in the body become low, iron deficiency anemia sets in. Red blood cells become smaller and contain less hemoglobin. As a result, blood carries less oxygen from the lungs throughout the body. Symptoms of iron deficiency anemia include GI upset, weakness, tiredness, lack of energy, and problems with concentration and memory. In addition, people with iron deficiency anemia are less able to fight off germs and infections, to work and exercise, and to control their body temperature. Infants and children with iron deficiency anemia might develop learning difficulties. Iron deficiency is not uncommon in the United States, especially among young children, women under 50, and pregnant women. It can also occur in people who do not eat meat, poultry, or seafood; lose blood; have GI diseases that interfere with nutrient absorption; or eat poor diets.

Scientists are studying iron to understand how it affects health. Iron's most important contribution to health is preventing iron deficiency anemia and resulting problems.

- Pregnant women

During pregnancy, the amount of blood in a woman's body increases, so she needs more iron for herself and her growing baby. Getting too little iron during pregnancy increases a woman's risk of iron deficiency anemia and her infant's risk of low birth weight, premature birth, and low levels of iron. Getting too little iron might also harm her infant's brain development.

Women who are pregnant should talk with their health care provider and take an iron supplement if recommended.

- Infants and toddlers

Iron deficiency anemia in infancy can lead to delayed psychological development, social withdrawal, and less ability to pay attention. By age 6 to 9 months, full-term infants could become iron deficient unless they eat iron-enriched solid foods or drink iron-fortified formula.

- Anemia of chronic disease

Some chronic diseases—such as rheumatoid arthritis, inflammatory bowel disease, and some types of cancer—can interfere with the body's ability to use its stored iron. Taking more iron from foods or supplements usually does not reduce the resulting

anemia of chronic disease because iron is diverted from the blood circulation to storage sites. The main therapy for anemia of chronic disease is treatment of the underlying disease.

Iron can be harmful if you get too much. In healthy people, taking high doses of iron supplements (especially on an empty stomach) can cause an upset stomach, constipation, nausea, abdominal pain, vomiting, and diarrhea. Large amounts of iron might also cause more serious effects, including inflammation of the stomach lining and ulcers. High doses of iron can also decrease zinc absorption. Extremely high doses of iron (in the hundreds or thousands of mg) can cause organ failure, coma, convulsions, and death. Child-proof packaging and warning labels on iron supplements have greatly reduced the number of accidental iron poisonings in children.

Some people have an inherited condition called hemochromatosis that causes toxic levels of iron to build up in their bodies. Without medical treatment, people with hereditary hemochromatosis can develop serious problems such as liver cirrhosis, liver cancer, and heart disease. People with this disorder should avoid using iron supplements and vitamin C supplements. The daily upper limits for iron include intakes from all sources—food, beverages, and supplements—and are listed below. A doctor might prescribe more than the upper limit of iron to people who need higher doses for a while to treat iron deficiency.

| Ages | Upper Limit |
|---------------------|-------------|
| Birth to 12 months | 40 mg |
| Children 1–13 years | 40 mg |
| Teens 14–18 years | 45 mg |
| Adults 19+ years | 45 mg |

Copper is also a very necessary micronutrient for the body. Copper is a mineral that is found throughout the body. It helps your body make red blood cells and keeps nerve cells and your immune system healthy. It also helps form collagen, a key part of bones and connective tissue. Your body does not need much copper. Many people do not get enough copper in their diet, but it is rare to be truly deficient in copper. Signs of possible copper deficiency include anemia, low body temperature, bone fractures and osteoporosis, low white blood cell count, irregular heartbeat, loss of pigment from the skin, and thyroid problems. Foods that contain copper include oysters, liver, whole grain breads and cereals, shellfish, dark green leafy vegetables, dried legumes, nuts, and chocolate.

The best way to get enough copper is through your diet. For your body to use copper, you need to have a balance of zinc and manganese. The following lists provide the recommended daily dietary intake of copper for children and adults from the Food and Nutrition Board at the Institute of Medicine.

- For infants from birth to 6 months: 200 mcg daily
- For infants 7 to 12 months: 220 mcg daily
- For children 1 to 3 years: 340 mcg daily
- For children 4 to 8 years: 440 mcg daily
- For children 9 to 13 years: 700 mcg daily
- For children 14 to 18 years: 890 mcg daily
- For adults 19 years and older: 900 mcg daily
- For pregnant women: 1,000 mcg daily
- For breastfeeding women: 1,300 mcg daily

Too much copper can cause nausea, vomiting, stomach pain, headache, dizziness, weakness, diarrhea, and a metallic taste in the mouth. Copper toxicity is rare but can cause heart problems, jaundice, coma, even death. Do not use copper supplements if you have diarrhea. Water containing copper concentrations greater than 6 mg/L may cause stomach problems, such as nausea and vomiting. If you have well water, you may want to get the water tested for mineral content.

In a study of 200 adults and children with celiac disease, of which 69.9% claimed to maintain a gluten-free diet, 15% had copper deficiency (less than 70 mcg/dL in serum in men and girls younger than 12 years and less than 80 mcg/dL in women older than 12 years and/or CP less than 170 mg/L) as a result of intestinal malabsorption resulting from the intestinal lining alterations associated with celiac disease. In its 2009 clinical guidelines for celiac disease, the American College of Gastroenterology notes that people with celiac disease appear to have an increased risk of copper deficiency and that copper levels normalize within a month of adequate copper supplementation while eating a gluten-free diet.

Copper deficiency is not common since most people can get the recommended amounts for this mineral by eating a varied and balanced diet. Copper deficiency is mainly caused by specific health conditions or genetic disorders that cause levels of copper to be lower than needed. Copper deficiency can have different impacts on our health, including anaemia, increased blood cholesterol, change of skin and hair colour, impaired immune function and damage of the nervous system. Copper deficiency is not a risk for the general population with a balanced diet since most people can get the recommended amounts for copper from a varied and balanced diet.

People should get most of their nutrients from food and beverages, according to the federal government's Dietary Guidelines for Americans. Foods contain vitamins, minerals, dietary fiber, and other components that benefit health. In some cases, fortified foods and dietary supplements are useful when it is not possible to meet needs for one or more nutrients

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