



Intestinal bacteria helps iron absorption! Be careful about short levels of iron

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Iron carries oxygen to the whole body

Minerals that cannot be produced in the body and must be taken from daily meals are called “essential minerals”. There are 16 kinds of essential minerals. The lack and excess of minerals cause various disorders, so we have to be aware of this for our beauty and health care. Among minerals, iron draws people’s attention because most of the time it tends to be insufficient.

There are 3 ~ 4 g of iron present in the body and is connected with proteins.

Approximately 70% of iron present in the blood is used as material for hemoglobin in red blood cells. Approximately 4% of iron becomes a component of a protein called myoglobin in muscles. This iron is called “functional iron” because it plays an important role of carrying oxygen taken from the lungs to the whole body.

Approximately 25% of iron is stocked in the liver, spleen and bone marrow and it is used when the iron becomes insufficient in the blood. This iron is called “stored iron”.

Approximately 0.3% of iron work as a component of key enzymes that are involved in energy metabolism.

What happens when iron become insufficient?

The main role of iron is to create hemoglobin in the blood which carries oxygen to every inch of the body and discharges carbon dioxide. If iron becomes insufficient, the level of hemoglobin decreases and that causes a shortage in oxygen supply to the body cells. As a result, the cells become incapable to produce energy which will make the body fall into the state of anemia with symptoms such as getting tired easily or a lack of stamina.

Other symptoms are headache, palpitation, short breath, loss of appetite and constipation. Also, psychiatric symptoms resulting from oxygen deficiency in the brain occur, including feeling unmotivated, a difficulty to think straight and getting a sense of depression. The lack of hemoglobin causes both mental and physical disorders.

In addition, the iron insufficiency brings dullness to the skin, so iron is an important nutrient for your beauty care.

Women are prone to iron deficiency so they should be aware of it

The lack of a few nutrients affect a lot of Japanese people. Iron is one of the minerals that makes many people to be concerned about its level in the body.

The recommended daily amount in Japan is 7.0 to 7.5 mg for men and 6.0 to 6.5 mg for women. According to the National Nutrition Survey conducted by the Ministry of Health, Labor and Welfare in 2011, men aged over 20 years old had an average of 8.1 mg of iron and women had an average of 7.5 mg. Both of them exceeded the recommended daily amount.

Despite the figure above, we need to pay attention to more than the actual amount of iron taken. Women have to be aware of a possibility of falling into an iron deficiency due to menstruation. Generally, the amount of iron that women lose in a single menstruation is about 25 to 30 mg. This amount is equivalent to 4 or 5 times more than the 6.0 to 6.5 mg of the recommended daily amount of iron for women. Therefore, the recommended daily amount during the menstruation period has to increase to 10.5 to 11.0 mg. Based on this result, the average iron intake of 7.5 mg for women tend to be insufficient.

Women are generally prone to have an iron deficiency due to menstruation. On top of this, there are many women who follow drastic diet programs or cut back meat and fish which contains a lot of iron. The problem of the iron deficiency among women is more severe than what we have expected. In recent years, about one in 10 women in their 30s developed anemia (hemoglobin level 11 g / dl or less). If we combine with women who would fall into anemia, one in every 5 women has low levels of hemoglobin (researched by the National Nutrition Survey in 2011). Iron is a very important nutrient for women.

Intestinal bacteria helps the absorption of iron!

Iron is an essential nutrient for many organisms. Iron exists in the form of “trivalent iron” in nature. This trivalent iron is hardly soluble in water and is difficult to absorb in its original

form. When the trivalent iron is converted (reduced) into a form of “divalent iron” it becomes soluble in water and easy to absorb.

The research team of Tokyo University of Technology has revealed that intestinal bacteria are involved into the conversion of iron from its original trivalent state to a divalent state.

The research team used mice to examine the ability of 4 intestinal bacteria present in the small intestine to reduce iron. As a result, all of 4 intestinal bacteria such as escherichia coli, butyrate-producing bacteria, lactic acid bacteria and bifidobacteria reduce trivalent iron into divalent iron in the intestines and help absorption of iron.

In addition, an Indian research team published their study result in 2010. It revealed that the number of lactic acid bacteria is low in the feces of young women who have an iron deficiency. Based on these research results, when we ingest iron, it is important to maintain the intestinal microbiota in a proper balance by ingesting and feeding good bacteria.

What will happen if we take too much iron?

Basically, a characteristic of iron is that it is hard to be absorbed by the body. Ferritin, one of the stored irons present in the intestinal mucosa, it regulates the promotion or suppression of the absorption of iron. By doing so, we are avoiding an excessive absorption of iron by in our bodies. For this reason, we almost never take too much iron from our daily diet.

However, if we continue to take excessive iron from dietary supplements, etc., gastrointestinal symptoms including vomiting will be caused. Once the symptoms progressed, siderosis, which increases the chance of developing organ damages such as liver damage or heart failure will take place.

When we supplement iron with dietary supplements, etc, we should follow its recommended daily amount.

References:

1. Press Release about the presentation at the annual meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry, Tokyo University of Technology, March 2013
2. Br. J. Nutr. 104, 931-934 (2010)