VITAMIN B12 DEFICIENCY AND DRUGS USED IN ITS TREATMENT

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Abstract: *Acute or chronic lack of vitamin B12 in the body causes many negative consequences for human health. Vitamin B12 deficiency is also observed during the development of some diseases or due to human internal factors. This, in turn, manifests symptoms observed in other diseases. Vitamin B12 deficiency must not be overlooked during treatment and diagnosis. Vitamin B12 is very important for the body.*

Key words: *megaloblastic anemia, immunity, vitamin B12 deficiency, blood cell formation, myelin sheath, depression, chronic fatigue, sprue disease, glossitis, optic neuropathy.*

Аннотация: *Острая или хроническая нехватка витамина B12 в организме вызывает множество негативных последствий для здоровья человека. Дефицит витамина B12 наблюдается также при развитии некоторых заболеваний или вследствие внутренних факторов человека. Это, в свою очередь, проявляется симптомами, наблюдаемыми при других заболеваниях. Дефицит витамина B12 нельзя игнорировать во время лечения и диагностики. Витамин B12 очень важен для организма.*

Ключевые слова: *мегалобластная анемия, иммунитет, дефицит витамина B12, образование клеток крови, миелиновая оболочка, депрессия, хроническая усталость, спру, глоссит, нейропатия зрительного нерва.*

Introduction. The need for vitamins depends on a person's age, gender, physical activity, the presence of chronic diseases, and the level of metabolism. Lack of vitamins accelerates the aging of the body.

Vitamin B12 or cobalamin is the most necessary and important vitamin complex for humans. Even a small deficiency of vitamin B12 causes anemia, fatigue, obsessive-compulsive disorder and depression in the body, and long-term deficiency of this vitamin has a negative effect on the human brain and central nervous system.

Vitamin B12 is mainly found in natural foods, animal products, as well as artificial products. There is nothing wrong with consuming more vitamin B12 than you need, the liver stores a 1-year supply and uses it when needed.

Vitamin B12 deficiency, mainly anemia, often causes mood disorders and negatively affects the nervous system, impairs memory.

In addition, vitamin B12 deficiency can cause shortness of breath, chronic fatigue, depression, anxiety, indigestion, dizziness, drowsiness, liver swelling, eye problems, hallucinations, headaches, tongue infections, balance problems, memory problems. loss,

nervous disorders, heart attacks, anemia, tinnitus, constipation, etc., as well as weight loss.

Main part. A nutritional deficiency of vitamin B12 is usually the result of inadequate absorption, but can also develop in vegetarians who do not take vitamin supplements. Deficiency causes megaloblastic anemia, brain and spinal cord white matter damage, and peripheral neuropathy.

- Lack of intrinsic factor (caused by autoimmune metaplastic atrophic gastritis, damage to the gastric mucosa, surgical operations on the stomach or gastric bypass);
- Blockade of internal factors;
- Decreased acid secretion;
- Diseases of the small intestine (for example, inflammatory bowel disease, chronic diarrhea, cancer, inflammation of the gallbladder or pancreas);
- Competition for vitamin B12 (in broad band infection or blind ring syndrome) AIDS often causes deficiency of this vitamin.

B12 is one of the most important vitamins in the human body. Many vital processes depend on it. Thus, water-soluble vitamin B12 is necessary for the formation of red blood cells, it synthesizes RNA and DNA, amino acids and proteins, and ensures the functioning of the nervous system.

Vitamin B12 is found in large quantities in fish, meat, poultry, shellfish, sheep's liver, shrimp, legumes (grains), dairy products, cheese and eggs. Liver, mackerel and beef are especially rich in them. However, it turns out that many people suffer from B12 deficiency and even anemia. At risk are the elderly, vegetarians, diabetics, and people taking antacids.

Milk and dairy products: Milk, yogurt, kefir or cheese, contains a large amount of protein, vitamins and minerals. 240 ml of milk provides 18% of our daily requirement for B12. Full-fat yogurt is also an important source of B12. Research shows that milk and dairy products contain more B12 than steak, fish or eggs.

Vegetables: lentils, radishes, broccoli, spinach, beans, peas, green beans, parsley are rich in vitamin B12.

Mushrooms: Vitamin B12 is found not only in meat products, but also in mushrooms, which are closest to it. B12 deficiency in the body can also be filled by eating mushrooms.

Eggs: chicken, goose, and quail eggs also contain vitamin B12.

Meat: Beef, lamb, especially lamb liver and kidney are rich in vitamin B12. They are one of the most nutritious foods.

Foods rich in vitamin B12 include sardines, mackerel, salmon, tuna, trout, and bluefish. At the same time, this type of fish is rich in Omega-3. Basically, the fat under the fish skin is rich in vitamin B12. 100 grams of fish provides 160% of the daily B12 requirement. In addition, vitamin B12 is found in shrimp.

Vitamin B12 supports normal body weight, strong immune system, healthy memory and healthy intestinal system. If it is stored for a long time and exposed to bright light, it becomes unusable if it is heated for a long time.

Vitamin B12 is a water-soluble vitamin that plays an important role in the normal functioning of the nervous system and the formation of blood cells. Its deficiency can cause serious changes in the body.

Vitamin B12 is one of the B vitamins and the only vitamin that the body can store and store. A large amount of vitamins accumulates in the liver and is consumed when needed, their reserves can last from several months to several years. Compared to vitamin B12, other B vitamins are used up faster. Therefore, vitamin deficiency due to increased demand or impaired absorption in the digestive tract becomes noticeable after some time. Vitamin B12 is called cobalamin, it plays an important role in various metabolic processes: it reduces the level of homocysteine, protects the heart and blood vessels; participates in the division and formation of blood cells, and is also necessary for the normal functioning of the nervous system.

Undiagnosed vitamin B12 deficiency can have serious consequences. Vitamin B12 deficiency can be prevented in cases of absorption disorders in the gastrointestinal tract.

Due to its participation in lipid metabolism, vitamin B12 plays an important role in the functioning of the nervous system. It participates in the formation of the myelin coating of nerve fibers, which in turn protects the nerves and ensures the correct transmission of nerve impulses.

Such "protection" of nerve fibers is important for both peripheral and central nervous system. In addition, vitamin B12 is involved in the synthesis of neurotransmitters and hormones that control cognition, mood and psyche.

Vitamin B12 is a cyanocobalamin produced in nature by microorganisms, in the body by the microflora of the large intestine. Vitamin B12 binds to mucopolysaccharide, a special substance in the walls of the stomach and duodenum, is absorbed into the blood, and is distributed with the blood to all tissues and organs. It accumulates in a large amount in the liver, so the liver, especially beef, is very rich in vitamins. Previously, patients with anemia were treated with liver. In 1948, vitamin B12 was isolated from liver extract. Vitamin B12 is called cyanocobalamin because it is close to the heme molecule in its chemical structure and contains cobalt bound to a cyano group. Vitamin B12 is a growth factor, participates in the formation of proteins, nucleic acids, increases regeneration, especially necessary for the renewal of blood cells - erythrocytes. After absorption into the blood, it turns into active coenzymes (cobamide, methylcobalamin). Coenzymes affect the metabolism of proteins and nucleic acids by transferring methyl groups and hydrogen. Vitamin B12 deficiency causes megaloblastic anemia (Addison-Birmer). This disease affects the blood, gastrointestinal tract and nervous system. Immature forms of red blood cells - megaloblasts increase in the blood, as a result of which the color index of the blood does not decrease, but rather increases,

the tongue becomes red, abdominal pain, vascular spasms and pains appear in the legs. In case of cyanocobalamin deficiency, replacement therapy is recommended for the above anemia. In addition, cyanocobalamin is used in other types of anemia, liver diseases - cirrhosis, infectious-toxic hepatitis, increases regenerative and detoxification activity of the affected liver, recovery from malnutrition, infectious and surgical diseases, radiation sickness.

Vitamin B12 together with folic acid is used in diseases of the nervous system - polyneuritis, cerebral palsy in children, and blood diseases due to increased production of myelin. Cyanocobalamin is administered parenterally, tablets covered with a separate capsule are used together with folic acid, it is less toxic, well tolerated by patients, sensitivity to the substance, allergic processes, excitability of the nervous system, pain increases. and tachycardia appears in the heart. During treatment with vitamin B12, it is necessary to periodically check the blood and blood clotting system, because. it thins the blood. It is forbidden to use in acute thromboembolic diseases, erythremia.

Babies and children need to get enough vitamin B12 as their bodies grow and develop. The elderly and vegetarians are especially at risk for vitamin B12 deficiency. In people who have very low intake of vitamin B12 due to strict diets (avoiding animal products), elderly people, often due to intestinal malabsorption and dietary restrictions, vitamin B12 deficiency is observed. Smokers and people with chronic diseases (diabetes, kidney failure, dementia), in many cases due to the side effects of long-term medications, are at risk of vitamin B12 deficiency. In patients with inflammation of the gastric mucosa or other diseases of the gastrointestinal tract (gastritis, colitis, etc.), the synthesis of substances necessary for the absorption of vitamin B12 is disturbed.

Tropical sprue is mainly recorded in the Caribbean Sea, South India, Southeast Asia; Local residents, tourists suffer from this disease. The disease is rarely reported in people who spent more than 1 month in endemic areas. The etiology remains unclear, but it is believed to be damage to the small intestine by toxigenic coliform bacteria. Folate malabsorption and vitamin B12 deficiency lead to megaloblastic anemia. Tropical sprue is rare in the United States, and worldwide incidence has declined in recent decades, likely due to increased use of antibiotics to treat acute travelers' diarrhea.

Often, a single patient, especially the elderly, has multiple risk factors that increase the risk of vitamin B12 deficiency. Thus, only 2-5% of people suffer from vitamin B12 deficiency during their youth, and 10-30% of people aged 65 and older may be diagnosed with B12 deficiency. Regardless of the cause of vitamin B12 deficiency, if diagnosed too late, there is a risk of chronic damage to the nervous system.

Symptoms of vitamin B12 deficiency usually include fatigue, memory loss, and muscle weakness. Malfunction of peripheral nerves often leads to symptoms such as impaired impulse transmission in nerve endings, weakness, pain in leg muscles.

Disturbances in the work of the central nervous system are manifested by the inability to concentrate, memory impairment, and mood swings.

Undiagnosed vitamin B12 deficiency can have serious consequences. If vitamin B12 deficiency is not detected for a long time, it can lead to neurological and psychoneurological diseases, including dementia and schizophrenia. Vitamin B12 deficiency can lead to paraplegia - severe physical limitations. This is caused by funicular myelosis, in which the sheath of nerve fibers is damaged. If the deficiency is detected in time, some consequences can be avoided. However, if there is severe vitamin B12 deficiency, damage to the nervous system cannot be reversed. Thus, vitamin B12 deficiency is an important problem that should be prevented in time.

Diagnosis of vitamin B12 deficiency. After eating, vitamin B12 is absorbed into the blood in different ways: first, the vitamin enters the stomach with food, where it binds to a factor called "intrinsic factor"; together they are absorbed in the small intestine and enter the blood. In addition, part of the vitamin can be absorbed into the blood from the intestinal walls without the participation of the "intrinsic factor". Only 20% of the total amount of vitamin B12 in the blood is the active form, and this substance is called holotranscobalamin (HoloTC for short). If the patient's condition is severe or there are signs of vitamin B12 deficiency, a two-step special blood test should be performed. In the first stage, the content of holotranscobalamin is checked, in the second stage, the concentration of substances involved in the metabolism of vitamin B12 (methylmalonic acid and homocysteine) is checked. With B12 deficiency, the concentration of these substances increases. Based on these tests, vitamin B12 deficiency can be detected and treated as soon as possible.

Diagnosing the lack of this vitamin in the body can be very difficult, but it will be possible to determine from the general symptoms that indicate its specific aspects.

First, the skin color of people with B12 deficiency is very pale or has a faint yellow tint. This skin condition is associated with a lack of red blood cells, which causes them to break down and increase bilirubin. Bilirubin is produced in the liver and is a product of broken down blood cells. A large amount of this substance in the body gives a yellow color to the skin and the whites of the eyes.

Another feature of vitamin B12 is the protection of nerve fibers. Therefore, when there is an imbalance, the work of the nervous system is disturbed. It manifests itself in the form of paresthesia - sensory disturbances, a sudden feeling of ants walking in the body, heat, tingling sensations.

Persistent weakness and fatigue are also important signs of B12 deficiency. The primary cause is a lack of red blood cells, which carry oxygen to the cells. With their deficiency, hypoxia develops: a person feels constant drowsiness, shortness of breath and dizziness.

Glossitis is another unpleasant consequence of B12 deficiency. This condition is accompanied by pain in the tongue, changes in its structure and color. In addition, swelling or crusting may appear on the tongue.

In rare cases, B12 deficiency can also damage the optic nerve, causing blurred vision. This rapid loss of vision is called optic neuropathy. Violation of the transmission of impulses from the eye to the brain causes strong eye twitching.

In rare cases, B12 deficiency can cause fever. According to a nutritionist, vitamin B12 deficiency causes body odor, loss of appetite, back pain, and regular headaches.

Although vitamin B12 is very important for our body, it should be consumed in moderation. The recommended daily intake for healthy adults is 3 micrograms. Children's bodies require a little less vitamin B12, and pregnant and lactating women need to take 3.5-4 μg per day.

Conclusion. Vegetarians and dieters, and patients with vitamin B12 deficiency can prevent vitamin B12 deficiency by eating foods rich in vitamin B12. Vitamin B12 is synthesized by microorganisms and is found almost exclusively in animal products - especially liver. Other products: Other animal products such as meat, fish, eggs and milk, as well as dairy products, are also rich in this vitamin. Vegetarians are advised to use dietary supplements to compensate for the deficiency. However, for the treatment of confirmed vitamin B12 deficiency, it is necessary to consult a doctor who will determine the optimal treatment regimen.

If the absorption of vitamin B12 is low, it is necessary to determine the reason for this. This may be due to impaired synthesis of "intrinsic factor" in the stomach, or reduced absorption of vitamins due to side effects of drugs such as metformin, which many people with type 2 diabetes take. Both malabsorption of vitamin B12 and deficiency of vitamin B12 can be corrected by taking high doses of vitamin B12. If there is significantly more vitamin B12 in the digestive system than in the blood, some of the vitamin B12 is naturally absorbed through the intestines. Thus, vitamin B12 deficiency can be gradually treated, even if its absorption is impaired.

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