



Information about vitamin B 12

by Harald Blomberg

B 12 or cobalamin is a vital vitamin which can only be produced in the gut of animals and not by man or by plants. B 12 is absorbed from animal food and the uptake of B 12 is complicated and easily obstructed especially in gluten sensitivity and celiac disease.

B 12 has a key role for the normal function of the brain and the nervous system and for production of blood cells and is involved in the metabolism of all cells. It is crucial for the synthesis of DNA and for cell division and is necessary for a healthy intestinal mucosa. It is also necessary for the manufacturing of the myelin sheathes around the nerve fibers and the transmission of nerve impulses. B 12 deficiency causes inflammation of the nerves which may trigger inflammation of the nerves, nerve pain and affect the function of many organs.

Causes of B 12 deficiency

The absorption of B 12 from the gut is very complicated and there may be several causes of B 12 deficiency. Since B 12 can only be found in animal products, vegetarians will sooner or later develop B 12 deficiency.

B 12 is stored in the liver and small amounts are excreted continually in the gall, that helps to digest fats. The cobalamin in the gall is almost

completely reabsorbed in the small intestine and brought back to the liver provided the small intestine functions normally.

The reabsorption of cobalamin from the small intestine explains why it can take twenty years to develop lack of B 12 after becoming a vegetarian but only one to three years if the reabsorption of B 12 is obstructed due to a disorder of the stomach or small intestine.

A healthy and well-functioning mucosa of the stomach is necessary for the absorption of cobalamin. Atrophic gastritis is an autoimmune disorder of the stomach mucosa triggered by gluten. It is common in celiac disease and obstructs the ability of the stomach to excrete hydrochloric acid, pepsin and intrinsic factor (IF). Since cobalamin is part of animal protein in the food we eat, it needs to be digested by hydrochloric acid and pepsin to be released and joined with intrinsic factor. The complex cobalamin-IF must then attach to specific receptors in the small intestine in order to pass into the blood.

The autoimmune process in the gastric mucosa is gradual and may last several years before the production of IF completely ends. Atrophic gastritis often occurs together with other autoimmune diseases such as rheumatoid arthritis, thyroid disease, Crohn's disease and psoriasis.

A healthy mucosa in the small intestine is required for a good resorption of B 12 from food. Therefore persons with a damaged mucosa of the of the small intestine due to celiac disease or gluten sensitivity can develop cobalamin deficiency in spite of the fact that they have a healthy stomach and no deficiency of IF or hydrochloric acid.

Nerve inflammation and nerve pain normal in B12 deficiency

The symptoms of cobalamin deficiency develop gradually and therefore the diagnosis may often be missed. Symptoms like fatigue and impaired memory are common in early stages and depression and even psychosis may develop when the deficiency gets worse. B 12 deficiency can also cause brain atrophy and dementia.

Neurological symptoms are caused by nerve inflammation and may be the first symptoms to appear. They may begin as numbness and creeping sensations in the toes that later ascend along the legs. There may also be poor circulation and coldness of the feet and the hands. Often there is nerve pain which may become severe in the feet and the legs. Nerve pain in the neck and back of the head, the forehead and the face is also common.

Inflammation of the brain nerves is common in cobalamin deficiency, which can cause symptoms such as impairment of hearing, vision, balance and articulation. If the optic nerve is affected vision will deteriorate and in the same way balance or hearing may suffer if the vestibular nerve is inflamed. Inflammation of the trigeminal nerve is common and it may cause poor articulation in children and pain in the forehead and face in adults.

There may also be inflammation in the nerves of the inner organs due to cobalamin deficiency. There may be fibrillation or uneven heart rhythm if the nerves of the heart are affected. There may be incontinence in adults and bed-wetting in children if the nerves of the bladder are affected. If the vagus nerve responsible for the mobility of the intestines is affected there may be constipation, which may become severe.

Anemia due to lack of B 12 is not as common as the symptoms stated above and may appear later than other symptoms. In many cases there is also an iron deficiency anemia which does not improve by iron supplement. In some cases there may be reduced production of thrombocytes in the bone marrow causing a bleeding tendency.

A specific symptom of cobalamin deficiency is a red and glossy tongue caused by reduced regeneration of the mucosa of the tongue.

B 12 deficiency in children

Mothers with severe lack of B 12 will pass on B 12 deficiency to their children. Symptoms of B 12 deficiency during pregnancy might be toxemia and hypertension. If the mother has depleted her B 12 stores

there is no B 12 in the breast milk. For this reason breastfeeding infants may develop disabling B 12 deficiency. Normally they get symptoms after 4-12 months, in severe cases earlier. In many cases these infants continue breastfeeding and refuse infant formula or normal food, which makes the lack of B 12 worse. Other symptoms may be hypotonic muscles, feeding difficulties, developmental delay, failure to thrive, lethargy, irritability, involuntary movements, seizures and cerebral atrophy. Involuntary movements and seizures may sometimes be the initial symptoms of Vitamin B12 deficiency. Infants who have severe lack of B 12 for a long time get impaired motor and cognitive development. Some children who got B 12 deficiency from their mother may manage much better and get symptoms later.

B 12 deficiency can be seen in both small and older children, e.g. those who have been treated for seizures as infants with B 12 for a period. Also children with celiac disease or gluten sensitivity and obstructed absorption of B 12 run the risk of developing deficiency. The symptoms may be fatigue, apathy, depression, attention and concentration difficulties. Such children seldom get a correct diagnosis. Instead they are diagnosed with ADD and treated with central stimulants. Children who are bed-wetters may have problems to control the bladder due to nerve inflammation caused by B 12 deficiency.

B 12 deficiency is common in autistic children because of poor absorption and restricted diet. If they are given methyl cobalamin there will be improvement of awareness, communication and speech.

Diagnosis and treatment with B 12

B 12 deficiency can be diagnosed with blood tests which may not always be reliable. If there are symptoms of deficiency, values below 550-600 pg/ml should be treated as a sign of deficiency. The problem with blood tests is that they don't give information about the amount of B 12 in the liver, where B 12 is stored. In severe B 12 deficiency there is also deficiency of cobalt and molybdenum which can be measured by bio resonance. Such deficiency indicates that the stores of B 12 have been depleted. Moreover bio resonance can also be used to diagnose nerve

inflammation and nerve pain which is very common in B 12 deficiency and often ignored by the health profession.

Supplement with B 12 should be given as methyl cobalamin.

Cyanocobalamin that many doctors prescribe are not effective to treat many of the symptoms of B 12 deficiency, especially nerve inflammation and nerve pain. Because of the obstructed absorption of B 12 from the gut B 12 given as supplements should not be swallowed. Adults should take B 12 as lozenges or injections. Children who are diagnosed with or suspected to have B 12 deficiency should be treated with methylcobalamin given as subcutaneous injections, nasal spray or drops. Methylcobalamin has no side effects and if there is lack of B 12 the positive effects will soon be evident provided that the child gets sufficient dosage (2-5 mg per day). Adults with nerve inflammation and nerve pain need at least 5 mg methyl cobalamin per day to improve. Improvement of nerve symptoms may take 4-6 months. In my experience it is more effective to give methyl cobalamin every day as drops than three times a week by subcutaneous injections.

When there is lack of B 12 there is usually a lack of other B-vitamins. It is therefore important that the child receives B-vitamin supplement when given B 12. Especially important is folic acid which the body requires in order to utilize B 12. Some people have a genetic inability to utilize folic acid and are unable to transform folic acid into its biologically active form, tetra methyl folate. These people usually have great problems with detoxification and may have high blood pressure. People who do not improve from taking methyl cobalamin may belong to this group and they should take methyl folate together with B 12.